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The Shiitake Mushroom–A History in Magic & Folklore

by Shantanu Tilak (from GoUNESCO, 27 July 2016)

In Chinese culture, the shiitake mushroom, known for its aphrodisiacal qualities, is a symbol of youthfulness and virility. The shiitake is vastly popular as a dietary choice in China and Japan. In Japan, the crème de la crème of shiitake crop is called donko. In China, it is known as shanku and dongo. The Chinese were the first to use the shiitake mushroom for nutrition and healing. According to a Chinese legend, around 5,000 years ago, a deity, Shennong, endowed the world with natural treasures including medicinal mushrooms. This laid the foundation for the conceptual framework of Chinese medicine based on super foods and acupuncture.

The Shiitake Mushroom- Image from Fresh Crop Mushrooms Online

Tapestries and Chinese manuscripts depict deities holding several species of medicinal mushroom, including the shiitake, which finds applications in Chinese culture as an aphrodisiac and a promoter of youthfulness and virility.

After the Chinese discovered the shiitake wild while scouring the extensive forest cover of the Chinese subcontinent, the Japanese developed a convenient method to cultivate mushrooms. Called the 'soak and strike' method, it involved inoculating a tree log with collected spores, and leaving them out in a moist atmosphere. The logs are cut from a tree and placed horizontally, followed by an injection of spores. In fact, this method was synonomous with the development of a male child into a man:

Chinese Scrolls depicting deities holding medicinal mushrooms. Photo credit: Crazy About Mushrooms

Soak and Strike Method is the most widely used technique to cultivate Shiitake Mushrooms. Photo credit: Sharondale Farm

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Upcoming Forays & Other Events

The events page of *The Mycophile* publicizes forays and events of NAMA affiliated clubs which may be of interest to our members. If you would like to list your club's next big event, contact Susan Kayser, Editor: mycophile@namyco.org.
Include date, location, brief description, link for information, and host organization name.

NAMA 2019 Annual Foray
8-11 August, 2019 | Paul Smiths, New York
The next annual foray will be held in the Adirondacks, at Paul Smith's College, Paul Smiths, New York on 8-11 August, 2019. Stay tuned to this space for details and updates.

Wildacres Regional Foray
26-29 September 2019 } Wildacres Retreat, North Carolina
Wildacres Retreat, located just off the Blue Ridge Parkway near Little Switzerland, North Carolina, is renowned for the identification of new species to the foray each year, and to the identification of new species to the mushroom kingdom. As an attendee, you will have the opportunity to search for fungi along the creek sides of Armstrong Creek, Linville Falls, and Crab Tree Falls, in the highlands of Mount Mitchell, and in many other areas along the beautiful Blue Ridge Parkway. Dr. Brandon Matheny returns as our chief mycologist for this year.

Dr. Matheny received his PhD from the University of Washington in 2003, and is currently an associate professor at the University of Tennessee-Knoxville. He and his students have studied and explored the fungal world across the county, with a focus in the Southern Appalachians, but also have ventured to Australia and South America. To learn more about this event, click here.

Interested parties, please see http://www.wildacres.org/ for more information about Wildacres Retreat, or contact registrar Glenda O'Neal, by email at: glendakoneal@yahoo.com, or by telephone at (423) 863-2742.

Registration is now open. The fee for this event is $260 per person, and includes three nights lodging, with double occupancy, and eight meals. There are no private rooms available. The registration form may be found at https://namyco.org/docs/Wildacres_Registration_2019.pdf. This foray is limited to 40 NAMA memberss and registration is expected to fill quickly. (For accounting purposes, please date your check for September 26, 2019. Checks will be deposited following the foray.)

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Message from the President
by Barbara Ching <laetiporous@gmail.com>

Happy 2019 NAMA Mycophiles!

My first step as NAMA's newly-elected president is to thank David Rust for all he has done in the past 6 years to advance our organization. We wouldn't have our website with its wealth of mycological information if it weren't for his efforts. Because of his focus on the advancement of mycology, any members who want to share information about the mushrooms they find can help build the North American Mycoflora—see http://www.northamericanmycoflora.org/ Local clubs can also seek funding for projects thanks to this initiative—and start dreaming about discovering a new species! David will be serving on the executive committee as past president, so I know we can continue to count on him to look for ways we can be at the forefront of citizen science.

Outgoing First Vice President Kathy Yerich is the force behind our fabulous promotional video—check it out here (and share it far and wide): https://tinyurl.com/y86q9n3m. This video really captures the spirit of NAMA: we're serious about our mission to promote mycology, and as amateurs, we can also be seriously devoted to the fun and friendship that our association creates. With our combined resources and continent-spanning membership, we can find more mushrooms, and learn more about them, than any one of us alone can do. I'm going to be looking for ways to plan more regional forays in addition to our big annual foray/bash so we can explore more of North America's mycoflora. Let me or foray chair Sam Landes (samland2@earthlink.net) know if your club would be interested in hosting one--with support from NAMA of course!

Those who attend the forays know just how valuable, unforgettable, and irreplaceable the experience is. No matter how many books you read and websites you check out, there is just nothing like roaming through the mushroom identification area and walking through the woods with enthusiasts and experts. Take a look at this small sample of the feedback Sam received after our October gathering in Salem, Oregon:

New lifetime member Christian Radcliffe attended his first annual foray; he writes that he especially appreciated the environment it created for members to "share in the passion and expertise of people who have experience . . . The talks I had with different members and watching the excitement around specimens was a treat for me this week."

Barbara with morel

Bruch Reed, who worked in the identification area, wrote to thank Sam and the foray committee for orchestrating "a wild success. It was a lovely venue; the food was AMAZING!…the [foray] locations were stunning, mushrooms appeared… Over 350 species!!!!"

I especially appreciated Oregon State University professor Seri Robinson's keynote address about spalted wood. Who knew that fungi could make such beautiful colors and patterns as they go about their rotting business? Valerie Nguyen's cooking demonstration incorporated mushrooms I never knew could be used so deliciously—reishi, for example. One of her recipes was included in the November-December 2018 issue of *The Mycophile.*

Be sure to mark your calendar for next year's annual foray at Paul Smiths College in the Adirondacks, August 9-12, 2019.

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Message from the President, cont.

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Finally, if we had more clubs forming across the continent, we could be finding more fungi and making more friends. While executive secretary, I was frequently contacted for advice about how to start a club and as president, I think it would be helpful to start several clubs all at once so that we can mutually support the pioneers and build some shared knowledge about how to get new clubs up and running. Again, let me know if you want to help get this initiative going.

We have a new Executive Secretary, Bruch Reed, a member of the Illinois Mycological Association and of the New York Mycological Society. Bruch has worked as an identifier and the past 3 annual forays so many of you may have met him or caught some rays of his mushroom-loving warmth. Our new first Vice President, Salma St John, of the Missouri Mycological Society. She brings strong interest and skills in applied mycology, such as cooking with mushrooms, to us, and you'll learn more about her in the next issue of *The Mycophile.*

The Shiitake Mushroom, cont.

cont. from p. 1

Logs inoculated during a child's birth would mature with him until he attained manhood, and inherited the 'fortune' in his backyard. Thus, the shiitake was a prized possession, and people went to the extent of robbing them from one another, leading to what was known as a 'shiitake war'.

It is interesting to note why the shiitake was endemic to only Asia. A scientific theory explains this by the analysis of spore dispersal of the mushroom that occurs due to directional of typhoon winds over long periods.

Recent academic inquiries in the field of medicine have deconstructed the composition of the shiitake to reveal the existence of active hexose correlated compounds, which are used in therapy and treatment for cancer patients. It is clear that the Orient deems mushrooms, in general, as storehouses of the power of healing. As compared to the depiction of the mushroom as a 'quaint fungus' in the West, what is known as the 'Orient' holds the mushroom in high esteem.

Today, the shiitake is grown in several parts of the world. The United States, for instance, cultivates mushrooms in several states, including Indiana and Pennsylvania. It has been incorporated in several ways to cooking over time, and in Japanese restaurants, it forms quite the supplement to a sushi roll or even a hot bowl of Bok Choy soup.

So the next time you feel under-nourished and in need of healing, trust the mythical power of the shiitake mushroom.

Bok Choy Shiitake Soup is a pretty healthy meal.
Photo credit: Feral Kitchen

McIlvainea: Volumes New and Old
by Laura Juszczak

Contributions to Volume 27 (2018) of the NAMA journal, *McIlvainea*, are available on the NAMA website. The volume commemorates the life of Gary Lincoff, with moving tributes from Eugenia Bone, Michael Beug and Dianna Smith. The essay, 'State of the World of Fungi' by Raymond Archambault also celebrates Gary's life. Catch the photo of the ape.

The first two parts of a four-part series exploring medicinal fungi, by Dianna Smith, are also included: 'Medicinal Fungi: Hype and Hope' and 'Ling Zhi, *Ganoderma lucidum*.' A wide range of related topics are woven together in this thoughtful and well-researched series on medicinal fungi. For example, the section on ling zhi sets the historical stage with a discussion of immortality elixirs—often quite the opposite—which were sought by Chinese emperors. The possible identity of ling zhi, first mentioned in the Han dynasty, is discussed, as well as its usage by ascetics. The Confucian and Taoist approach to health and medicine in China are also explored. This is a rich and complicated subject; stay tuned for the last two parts in this series in volume 28, 2019, where topics include the use of microfungi as antibiotics and the pharmacological properties of macrofungi.

The volume is rounded out with two reports from Michael Beug on North American mushroom poisonings: one for 2017 and a twelve-year summary spanning 2006 to 2017.

Lastly, something old is new again. Volume 1, issue 1, from 1972 is available online and is searchable! If you scroll to the bottom of the *McIlvainea* volume list, you will find in volume 1/1: "The Man Who Ate Mushrooms", "The Watling Papers", "Hints on the Microscopical Examination of the Agaric Fruit Body", "Key of Northeastern Amanita", and "Key to Northwest Mushrooms (Amanitas)". Other back issues will follow.

Submissions for Volume 28 (2019) are welcome and encouraged: contact Laura Juszczak at laurajust54@gmail.com. Happy hunting.

Squirrels and Amanitas
from Brian Park

According to Dr. John Rippon, an Illinois Mycological Association member and world expert on fungal diseases, squirrels have an interesting adaptation that allows them to eat mushrooms containing deadly amanita toxins without being affected. There are three important chemicals in the amanitas. Two will knock you right off, but are destroyed in cooking. The third one is the interesting one: it consists of the second amanitin, bound tightly to a glycoprotein molecule. When we digest the mushroom, the enzymes in our gut break the bond between the toxin and the glycoprotein, leaving the toxin free to enter our bloodstream, while the glycoprotein is excreted (a glycoprotein is a mucus molecule, in case you don't know). What the squirrels have done is line their gut with a toxin-compatible glycoprotein, so that as soon as it gets split from its original glycoprotein molecule, it gets rebound to the squirrel glycoprotein, and excreted along with it. Obviously, the squirrels don't cook their food to destroy the first two molecules, but presumably those get bound in exactly the same way. Thus, squirrels and a few other animals (guinea pigs also, I believe) can eat mushrooms that are highly toxic to other animals with no ill effects.

Brian Park works for a Californian newspaper called the *Independent Coast Observer*. He wonders if the squirrels eat the amanita to get a psychotropic reaction.

2019 Annual Photo Contest Rules
by John Plischke

Eligibility
The Photo contest is open to all mushroomers. NAMA membership is not required to enter. Images that have previously won (including honorable mention) are not eligible. Up to 15 images may be entered per person, with a maximum of 6 in the Pictorial, 6 in the Documentary and 3 in the Judges Option to make a total of up to 15 images. Closing date: All entries must be received by the Contest Director on or before June 8, 2019.

Subject Material
For Pictorial and Documentary, organisms from the *Myxomycota* (slime molds) and the classes *Basidiomycetes* and *Ascomycetes* of the Eumycota ("true fungi") are eligible. For Judge's Option, nearly anything goes, so long as the theme relates to fungi, and fungi are a key element of the photograph.

Entry Divisions

Limited or Advanced. If you won first, 2nd, or 3rd place 2 or more times before the due date, you must enter in the Advanced division, If you won less than twice before, you can enter the Limited Division .

Categories
Pictorial- This division is for single photos that illustrate the beauty and variety of fungi in form and color. Mushrooms should not be cut or turned over and should look natural. Judging criteria include consideration of both technical (focus, depth of field, exposure, lighting, color, absence of distracting elements) and artistic (composition, color, background, lighting) aspects.

Documentary- For single photographs especially suited as illustrations in a field guide of monograph, or for use in a lecture. Emphasis is placed on portrayal of key morphological characteristics such that the usefulness of the image as an identification aid is maximized. Subjects may be shot in the field, laboratory or studio and the photographer has complete freedom to cut, process, manipulate, or orient the specimen in any desired manner to achieve the goal. Close-ups of single features and photomicrographs are acceptable. Judging criteria will be the same as in the Pictorial category but they will be of secondary importance to the overall mycological utility of the photo. Accurate identification of the subject will be a consideration.

Judge's Option- For single photos or series which do not fit into the Pictorial and Documentary divisions. Examples include time-lapse series, ecological relationships of fungi (e.g. fairy rings), fungi with animals, people enjoying fungi, humor, etc.

Awards- First 2nd and 3rd place will be awarded in Pictorial, Documentary and Judges Option. Honorable Mentions will also be noted for some Pictorial and Documentary photos. This year, award certificates will be emailed or given to first through 3rd place winners.

Marking, Listing and Submitting Digitals
Let us know if you are entering the limited or advanced division. The digital photos file name can include 3 things: D (for Documentary) JO, (for Judges Option) or P (for Pictorial), and your (the photographer) initials, followed by the Genus and species of the fungi, or the title for the Judges Option photo. Digital images may be emailed or mailed on a CD or DVD and will not be returned. Mail images to John Plischke III, 411 Center Avenue, Greensburg, PA 15601 724-832-0271 Fungi01@aol.com. If emailing in images, please include your name, address and phone number. Images can also be submitted using free file mailing programs such as http://www.mailbigfile.com/ or Dropbox, etc.

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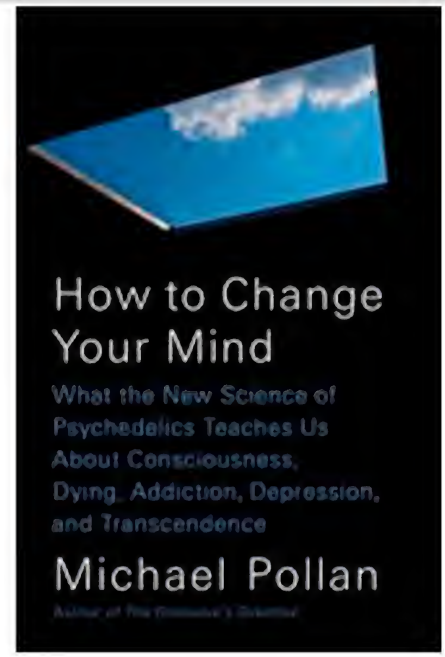
Book Review: "How to Change Your Mind" by Michael Pollan reviewed by Barbara Ching

I've been reading Michael Pollan since he published his first book, *Second Nature: A Gardener's Education,* in 1991. He writes textbook-model exposition and non-fiction narrative, and his signature technique of juxtaposing the scientific knowledge he is conveying with his everyday life testing of this knowledge served him well in his first book and most of his others, including *The Omnivore's Dilemma: A Natural History of Four Meals* (2006) and *Cooked: A Natural History of Transformation* (2013). In these books, I especially enjoyed Pollan's personalized takes on the topics at hand. His latest book, *How to Change Your Mind: What the New Science of Psychedelics Teaches Us About Consciousness, Dying, Addiction, Depression, and Transcendence* (2018.) is no different in structure from Pollan's earlier "natural histories." Alternating between what he calls "telling the story of psychedelic research, past and present" and "travelogues", Pollan recounts his "trips" on various psychedelics. This time, though, I found the expository parts of the book more interesting than Pollan's account of his psychedelic experiences—even though his "trips" range from hunting for Psilocybe azurescens with Paul Stamets and then eating his find several months later, to holotropic breathing, to inhaling smoked toad venom (aka 5-MeO-DMT).

H*ow to Change Your Mind* tells a fascinating story about the current state of research into therapeutic applications for psychedelics. While Pollan recounts the stories of familiar, countercultural figures in the "science of psychedelics" such as Aldous Huxley and Timothy Leary, he introduces many less flashy but equally fascinating figures in the "second wave" of research, such as Bob Jesse, educated as a computer scientist/electrical engineer, who now works to move the use of psychedelics into American culture not only as a way to treat psychological distress but also to facilitate "the betterment of well people". Likewise, we learn of Al Hubbard, "the Johnny Appleseed of LSD" who introduced the practice of Shamanism to treat alcoholism in the 1950s—often relying on his own financial resources to provide the treatment. Pollan segues into the institutional difficulties that face this type of research by underscoring the differences between the individual, guided therapies that Hubbard and others employ, versus the control groups (including those given placebos) that characterize conventional pharmacological research. Similarly, he returns frequently to the importance of "set and setting" in the use of psychedelics, elements that inevitably introduce variables.

While an individual's state of mind and environment will affect the psychedelic experience he or she undergoes, Pollan insufficiently recognizes how these factors shape his own experiences. He brings fairly limited concerns to them—an interest in navigating his approaching old age and vague hopes of transcending the ego. He has access to an expense account, contacts, guides, and substances that most readers won't have. These


How to Change Your Mind
What the New Science of Psychedelics Teaches Us About Consciousness, Dying, Addiction, Depression, and Transcendence
Michael Pollan

differences seemed less striking in his books about cooking and eating; moreover, these pursuits don't pose immediate legal issues. Even without these obstacles, if you had only his account to go on, you might not be especially interested in his "travelogue." Pollan experiments with a tiresome doggedness and measures his "results" against a checklist. After his experiment with "the toad", he scores 61 points on the Revised Mystical Experience Questionnaire, "one point over the threshold for a complete' mystical experience". No matter how much he talks about transcending the ego, he wants to measure up to the psychonauts who preceded him, even as he undermines the very notion of transcendence with this impulse.

Pollan addresses the diffic-ulties he found in writing about his experiences in a *New York Times* essay published on December 24, 2018. In "How Does a Writer Put a Drug Trip into Words," he claims that he found two models for this task: Aldous

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NORTH AMERICAN COMPREHENSIVE CHECKLIST

by Andrew Miller

CHAMPAIGN, Ill. — Some fungi are smelly and coated in mucus. Others have gills that glow in the dark. Some are delicious; others, poisonous. Some spur euphoria when ingested. Some produce antibiotics.

All of these fungi—and hundreds of thousands, if not millions, more—occur in North America. Of those that are known to science, 44,488 appear in a new checklist of North American fungi, published this month in the journal *Mycologia*.

Coprinus micaceus grows on decaying wood.
Photo by Daniel Raudabaugh

"This checklist provides the basis for understanding our national mycoflora, which is timely since there is renewed interest in cataloging all North American fungi," said Illinois Natural History Survey mycologist Andrew Miller, who led the effort to compile the data. "Hundreds of citizen scientists are interested in helping with this project."

The *Rhodotus palmatus* mushroom is sometimes called "rosy veincap" or "wrinkled peach." Photo by Daniel Raudabaugh

Illinois Natural History Survey mycologist Andrew Miller and his colleagues created the first comprehensive checklist of North American fungi. In his right hand, Miller holds the Western giant puffball *(Calvatia booniana)*, and in the other hand, chicken of the woods *(Laetiporus sulphureus)*. Photo by L. Brian Stauffer

By conservative estimates, scientists have so far documented less than one-third of all fungi thought to exist in North America, said Miller, who also is an affiliate of the department of plant biology at the University of Illinois at Urbana-Champaign, where the INHS is based. Collaborators on the checklist include Scott Bates, of Purdue University Northwest, and the Macrofungi and Microfungi Collections Consortia.

A black, slimy icing of spores on the cap of *Dictyophora duplicata* smells like rotting meat, attracting flies, which disperse the spores to new sites. Photo by Daniel Raudabaugh

While thousands of species of fungi were first identified and described from Europe, many North American fungi have evolved and diversified. Others are unique to the continent, Miller said.

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"Many fungi in North America have European names, and while they may be related to their European counterparts, they often are genetically distinct," Miller said. "About half of the 44,488 fungi in the new checklist are type specimens, which means they are valid North American taxa."

To compile the checklist, the team searched over 2.2 million records using the Mycology Collections Portal, which includes data from numerous universities, botanical gardens and other institutions.

Hericium is a genus of edible mushroom that grows on decaying wood. Photo by Colleen Lappe

About 20,000 of the fungi in the checklist are mushrooms; the rest are barely visible with the naked eye and are thus classified as "microfungi," Miller said. These include molds, mildews and rusts, along with species that break down organic matter in the soil.

The honey mushroom *(Armillaria mellea)* is a common root pathogen in North America. Photo by Daniel Raudabaugh

Some of the microfungi are pathogens, others are useful. *Penicillium* is best known for the production of penicillin. Microfungi also include yeasts that aid in breadmaking and alcohol production, along with those that contribute to infections like athlete's foot and yeast infections.

The macrofungi can range in size from the barely visible to the colossal, Miller said. "One of the largest living organisms on the planet is a honey mushroom, *Armillaria solidipes*," Miller said. "It lives in the Malheur National Forest in eastern Oregon, where it grows—mostly hidden—underground. It stretches 3.5 miles across, covers an area larger than 1,665 football fields and is believed to be more than 2,400 years old."

Another fungus, the giant puffball, *Calvatia gigantea,* may contain as many as 7 trillion spores, "If every spore actually germinated and grew into a puffball, the puffballs produced would weigh more than the Earth," commented Miller.

Fungi have co-evolved with plants for millions of years and were instrumental in helping plants transition from aquatic environments onto land, Miller said. They are essential to the cycle of life, breaking down organic matter and converting it back to its fundamental components.

Mushrooms of the genus *Morchella*, also known as morels, are delicious. Photo by Anna Weyers, USFWS

"Although an estimated 1.5-5.1 million species of fungi are believed to exist on Earth, only about 120,000 have been discovered and described," Miller said. "Obviously, we have a lot of work to do to fill in the gaps of our knowledge, but this checklist is a first step to getting our arms around North America's fungi."

The INHS is a division of the Prairie Research Institute at the U. of I.

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2019 Photo Contest Rules, cont.

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Reproduction

Entry in the contest constitutes the consent of the photographer to allow NAMA to reproduce copies of each winning image (including Honorable Mention etc.) for circulation or use by NAMA Committees, among the membership, NAMA brochures, signs, advertising and affiliated societies. NAMA also reserves the right to post images of the winning images on the NAMA website and in *the Mycophile* and to be used by the marketing committee. All copyrights remain with the photographer.

Photo of You

If possible, please include a photo of yourself, so we can use it to introduce the photographers. This is not a requirement and the photo of yourself is not counted as an entry. It has also been requested that we start to collect data on where the mushroom photo was taken. We don't need GPS coordinates, but it would be helpful to have a city/county/park/state name—something basic to post on the site for future reference.

Book Review, cont.

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Huxley's *The Doors of Perception* (1954) and the less well-known French writer Henri Michaux's *Miserable Miracle* (1991). Huxley, he argues, is too literary and polished to be authentic and Michaux's authenticity makes his account too incomprehensible. Pollan explains that he settled on an approach that speaks to the reader from the visionary perspective of the trip and. in a more pragmatic, pedagogical voice, reminds his audience that one of the features of psychedelia is the ineffable, the superseding of what language can express. He reminded many times.

I suspect the dullness of Pollan's trip stories springs from his by now well-worn non-fiction structure and his unimaginative sense of set and setting. While it's not surprising that most of the researchers (and literary models) that Pollan reports on are white men, in his sections about the psychedelic experience, surely he could have focused more on experiences of a more diversified group of experimenters in addition to, or instead of, himself. Similarly, Pollan makes no effort to grapple with the question of how his experiences can apply to others. In contrast, in *Mycophilia* (2011), Eugenia Bone describes her experience with mushrooms more widely. Near the end of her first trip, she decides to take a bath and shares one revelation "with my lady readers of a certain age": "While in the bathtub, I stopped feeling guilty about growing older and regretful about losing my looks, and then I realized my body was a vessel, like a ship that was taking me through life, and it functions well, and that made it beautiful, and I felt grateful. It was a tremendous relief that I still feel today". She found the words to share this experience by transcending her ego, by recognizing that her "set and setting" can be connected to the concerns of many other people.

I don't regret reading *How to Change Your Mind.* It's especially interesting to encounter people connected to NAMA in these pages: Michael Beug, who spoke about his experiences with psilocybin mushrooms at the NAMA 2017 foray, and frequent speaker and supporter Paul Stamets. Most importantly, the book passes the test announced in its title by convincing me that psychedelics do teach us much about the topics listed in the subtitle, that they can help us in our existential struggles and amplify some life's joys.

North American Catalog, cont. https://news.illinois.edu/view/6367/722471#image-4

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This project was made possible by the National Science Foundation's Advancing Digitization of Biological Collections program, which supports the Macrofungi Collections Consortium and the Microfungi Collections Consortium.

Editor's notes: To reach Andrew Miller, call 217-244-0439; email amiller7@illinois.edu.

The paper "The protochecklist of North American nonlichenized fungi" is available online and from the U. of I. News Bureau.

NAMA 2018 PHOTO CONTEST WINNERS – JUDGES OPTION
by John Plischke

Judges Option 1st Place
Fistulina hepatica sushi
by the 3 Foragers

Judges Option 2nd Place
Purple millipedes on mushroom
by Daniel Winkler

Judges Option 3rd Place
Boletus edulis bacon
by The 3 Foragers

Judges Option Honorable Mention
Stereogram
by Carmela Khourie

NAMA 2018 PHOTO CONTEST WINNERS – LIMITED DOCUMENTARY
by John Plischke

Limited Documentary 1st Place
Laccaria bicolor
by Richard Tehan

Limited Documentary 2nd Place
Pseudoomphalina angelesians
by Richard Tehan

Limited Documentary 3rd Place
Hygrocybe flavescens
by Richard Tehan

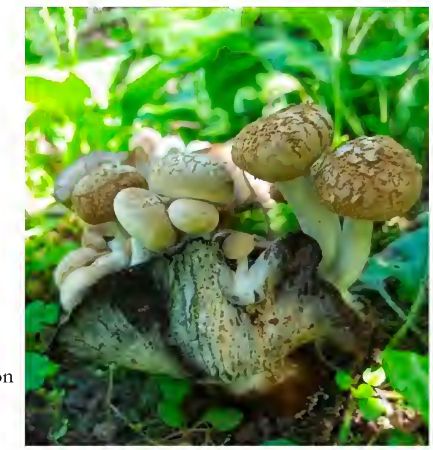
Limited Documentary Honorable Mention
Tricholoma magnivelare
by Richard Tehan

NAMA 2018 PHOTO CONTEST WINNERS – LIMITED PICTORIAL
by John Plischke

Limited Pictorial 1st Place
Aureoboletus mirabilis
by Richard Tehan

Limited Pictorial 2nd Place
Pluteus aurantiorugosus by Marjie Carr-Oxley

Limited Pictorial 3rd Place
Mycena haematopus.
Spinellus fusiger
by Marjie Carr-Oxley



Limited Pictorial Honorable Mention
Asterophora lycoperdoides
by Marjie Carr-Oxley

Limited Pictorial Honorable Mention
Hericium erinaceus by Carmela Khourie

Limited Pictorial Honorable Mention
Leatiporus conifericola by Richard Tehan

NAMA 2018 PHOTO CONTEST WINNERS – OPEN DOCUMENTARY
by John Plischke

Open Documentary 1st Place
Ascopolyporus philodendri by Daniel Winkler

Open Documentary 2nd Place
Tricholomopsis sulfureoides
by Drew Henderson

Open Documentary 3rd Place
Caloboletus roseipes
by The 3 Foragers

Open Documentary Honorable Mention
Pisolithus tinctorius by Mark Bower

Open Documentary Honorable Mention
Psilocybe cyanescens by Drew Henderson

NAMA 2018 PHOTO CONTEST WINNERS – OPEN PICTORIAL
by John Plischke

Open Pictorial 1st Place
Marasmius tageticolor gills
by Daniel Winkler

Open Pictorial 2nd Place
Mycena chlorophos by Daniel Winkler

Open Pictorial 3rd Place
Lycoperdon perlatum by The 3 Foragers

Open Pictorial Honorable Mention
Craterellus fallax by Mark Bower

Open Pictorial Honorable Mention
Pseudohydnum gelatinosum by Daniel Winkler

Open Pictorial Honorable Mention
Rhodotus palmatus by Mark Bower

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Change Service Requested

Newsletter of the North American Mycological Association

THE MYCOPHILE

Mushroom of the Issue

Leratiomyces ceres

Psilocybe allenii

Leratiomyces ceres or the "Red Spy" is a beautiful and widespread member of the *Strophariaceae*. Thought to originate in Australia, it has been introduced around the world. In America this species often appears in wood chip beds. It has spread extensively on the west coast, but can also be found in eastern NA and south into Mexico. Its moist, brilliantly red or orange cap can show whitish veil remnants. Its white stipe stains orange, and its white gills soon turn purple-brown with spore drop; pluck one and you will see copious, coarse white mycelia, weaving through the wood chips. With its eye-catching coloration, the "Red Spy" sometimes serves to direct your eye to a highly coveted but quite drab companion mushroom: *Psilocybes*! Here in the San Francisco Bay Area, both *Psilocybe cyanescens* and *P. allenii* are often found in conjunction with *Leratiomyces ceres.*

by Debbie Viess

Newsletter of the North American Mycological Association

THE MYCOPHILE

FORAY FLASH APRIL 2019 www.namyco.org

Our Adirondack History: Looking Back, Looking Forward

by Barbara Ching

OUR 2019 ANNUAL NAMA FORAY on August 21 will take us to an astonishing state park with deep roots in Native American tribal and American history and, perhaps more surprisingly, in the history of mycology.

North American History

Originally inhabited by Mohawk and other Iroquois tribes, Adirondack Park encompasses over 6 million acres (only two national parks are larger: Wrangell-St. Elias and Gates of the Arctic, both located in Alaska) The park was formally created in 1892 but its mountain range, lakes, and rivers had already entered the American imagination as places of wild beauty vital to our national identity. In 1792, Thomas Jefferson honored Lake George as "The Queen of American Lakes" praising its size as well as "its water limpid as crystal and the mountainsides covered with rich groves of silver fir, white pine, aspen and paper birch."

James Fenimore Cooper set some of his immensely popular novels in the area, most notably the apocalyptically-titled *The Last of the Mohicans* (1826). Winslow Homer painted landscapes there for nearly 40 years. *Indian Village, Adirondacks* (1894), a Homer watercolor, portrays an apparently abandoned settlement surrounded by mountains and a mirroring lake. As in Cooper's novel, with its emphasis on wilderness adventures and Indian demise, Homer creates not only an artistic achievement inspired by the majestic Adirondack landscape but also a troubled reflection on the decimation of the land's original inhabitants.

In 2017, in order to more clearly face this genocide and honor the survivors, Adirondack Experience, The Museum on Blue Mountain Lake opened a permanent exhibit on the Mohawk and Abenaki tribes. Museum Director David Kahn explains that "we're hoping that this exhibit will be a kind of wakeup moment for anybody who might have had that misperception that this wasn't Mohawk and Abenaki territory" (https://newsmaven.io/indiancountrytoday/archive/adirondack-museum-dispels-myths-with-native-exhibit-EOVqpdCw4ka5XIlFTI-_aA/). Descendants of these native people now live just outside of the park, 50 miles northeast of Paul Smith's, on the St. Regis Mohawk reservation, straddling the Canadian border, or in communities near Lake Champlain.

The New York State Constitution specifies that Adirondack Park, along with Catskills Park to the south, comprises a forest preserve that must remain "forever wild." However, some sections of the park are wilder than others. About half of the land is privately owned; 135,000 people live there. Some

Winslow Homer, Indian Village (1894). Fogg Museum, Harvard University. Public Domain.

logging and farming also takes place. The Nature Conservancy has purchased land as private owners put their holdings on the market and plans to sell these parcels to the State of New York in the future.

NAMA History

We'll be based in the northern section of the park, at Paul Smith's College, a liberal arts college named after the founder of the first "wilderness resort" in the area. Paul Smith's hotel opened in 1859 (before the park was established). You can learn more about the hotel, the area, and the gilded age elites who frequented it here: https://andyarthur.org/explore/new-york-state/franklin-county/saint-regis-canoe-area/lower-and-upper-saint-regis-lake.

When the hotel burned down in 1930, Smith's son Phelps donated the land and the Smith estate for the establishment of Paul Smith's College. The first students enrolled in 1946. The college teaches culinary arts, hotel and restaurant management, and forestry so it's a good place for people like us. NAMA members Sue Van Hook and Susan Hopkins teach field mycology there.

This spot has already earned a place in NAMA's history as host of our 1991 foray, organized by the Mid-York Mycological Society. The New Mexico Mycological Society has a fascinating history of NAMA forays on their website; here's how the account of the first Paul Smith's foray begins: "Sam Ristich led forayers upward to lichens (half-fungi, right?) and Kit Scates pushed us to our knees looking at leaf fungi." To read more, see http://newmexicomyco.org/content/nama-foray-history-0. If you have memories and photos of the 1991 foray, please share!

The Northeast Mycological Federation (NEMF) held successful forays at Paul Smith's College in late August 1987 and mid-August 2011. You can see

Map of Adirondack Park regions

collection data from those forays by following this link http://www.nemf.org/collection-data/foray-data-1987-2018/.

Roy Halling, who will be our Chief Mycologist at this foray, refers us to the following article written by William Murrill (1869-1957), originally published in *Mycologia,* a scholarly journal Murrill founded in 1909 (and now the official journal of the Mycological Society of America). Murrill describes the species he found on an August 1915 visit to the Upper St. Regis section of Adirondack Park, very near Paul Smith's College. The article is a delight, not only because of the extensive variety of named species but also because of Murrill's charming prose style and the photographs that make me wish I had been in the collecting party. In a sense, I will be: one of the wonderful features of our forays is the opportunity to make new friends and reconnect with people we have met at previous forays. Please share your comments and updates on Murrill's observations. It will be fascinating to see how our final species list compares to Murrill's.

Foray Committee Chair Sam Landes has planned some intriguing presentations and workshops for us. There will be a presentation on cultivating Hericium ("Lion's Mane") mushrooms as well as a workshop on creating medicinal tinctures with them. John Plischke III will lead a workshop on the use of reagent chemicals to help identify mushrooms. Participants will be able to take a small reagent kit home! John will also teach a photography workshop. Of course, there will be a delicious mycophagy and a wide selection of foray sites. A complete list of distinguished speakers will be available soon. **Registration goes live this week!**

Paul Smith's College on Lower St. Regis Lake

Murrill could have called this Adirondack interlude a foray. It had all the best attributes of one—a group of friends and fascinating characters taking time away from their daily lives to enter the forest in the company of trained mycologists and other expert identifiers. They carefully identify and record their finds in order to "promote and advance the science of mycology" (as our website logo says) and feast on their best edibles. In short, they have a great time, they learn a lot, and they pass it on. You'll notice in the picture on p.11 that Murrill's group spans the generations—someone even included their baby! Since our foray takes place over the summer, I hope we'll see more children in attendance.

Maybe William Murrill himself will join us in the woods. Strange encounters with him have happened before. In *Mycena*, the Mycological Society of San Francisco's Sep 2006 newsletter, Peter Werner wrote, "In 1926, George F Weber, a mycologist and plant pathologist was visiting a Gainesville resort called the Tin Can Tourist Camp with his wife. In the recreation hall, they came across and unkempt and haggard, yet 'tall, robust, dignified, pleasant stranger providing a piano concert for the transient tourists.' Weber soon recognized the stranger as none other than Murrill."

MYCOLOGIA

VOL. VII NOVEMBER, 1915 No. 6

PRELIMINARY LIST OF UPPER ST. REGIS FUNGI

WILLIAM A. MURRILL

(WITH PLATES 167–169)

It was my good fortune to spend the last week in August, 1915, with Mr. and Mrs. N. H. Luttrell at their camp on the Upper St. Regis, surrounded by virgin forests of balsam fir, spruce, and hemlock, often mixed with birch and rarely with maple and beech.

Fungi were unusually abundant, for it was the height of the season and one of the best years for fleshy forms ever known in the Adirondacks. Every facility was at hand, also, for collecting, drying, and otherwise caring for the specimens; and a dozen friends stood ready to lend me a helping hand.

Under these favorable circumstances, it was deemed advisable to make both a qualitative and a quantitative survey of the more conspicuous fungi appearing in the vicinity during the week, with the hope of assisting the large number of mycologists and other nature lovers who visit the Adirondacks during late summer.

The number of species collected was over 300, and this number might have been largely increased if attention had been given to inconspicuous woody and leathery forms and to species occurring on leaves. A number of the rarer species found have not yet been definitely determined and will not appear in the list to follow.

[MYCOLOGIA for September, 1915 (7: 221–296), was issued September 15, 1915.]

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VIEW OF UPPER ST. REGIS LAKE FROM CAMP KANOSA

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Special attention was given to edible and poisonous fungi. About 35 species were eaten, many of them in quantity and prepared in various ways. Many other edible species were not eaten because the specimens had to be preserved. Those accustomed to the fleshy forms occurring about New York City are entirely unprepared for the remarkable difference in the Adirondack fungous flora, which is distinctly northern unmixed with southern elements and is associated with coniferous forests rather than deciduous woodlands in which oaks and chestnuts are dominant.

FIG. 1. Landing at Camp Kanosa.

The following list contains a few notes on points of special interest. The abundance of a species is indicated by exponents, the numerals *1–5* denoting a definite number of times collected and the letters *n*, *nn*, and *nnn* meaning "frequent," "common," and "very common" respectively.

A. MYXOMYCETES

Fuligo septica[2]
Reticularia Lycoperdon[2]

B. ASCOMYCETES

Cordyceps militaris.[1] Found in Isaria form only.
Cudonia lutea[n]
Daldinia concentrica[2]
Helvella Infula[2]

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Lachnea hemisphaerica.[2] Very abundant at one place in low mixed woods.
Lachnea scutellata.[2] On dead beech logs.
Leotia lubrica[n]
Macropodium macropus[nn]
Mitrula vitellina[1]
Peziza abietina.[1] Very abundant in one spot in low mixed woods.
Spathularia velutipes[4]
Xylaria polymorpha[n]

C. HYMENOMYCETES

a. TREMELLALES

Tremella lutescens.[2] On hemlock logs.
Tremella mycetophila.[1] On *Collybia dryophila.*
Tremellodon gelatinosum.[1] On coniferous log.

b. AGARICALES

1. Thelephoraceae

Craterellus cornucopioides.[1] Abundant at one spot in the edge of coniferous woods.
Thelephora laciniata[n]

2. Clavariaceae

Members of this family were very abundant everywhere on the ground in the woods. The most abundant species was what I determined as *Clavaria cinerea.* Other species found were:

Clavaria fusiformis[2]
Clavaria pinophila[1]
Clavaria pistillaris[1]

3. Hydnaceae

Members of this family were very rare, as is usually the case. Three species belonging to the *H. zonatum* group were found, but these have not been definitely determined.

Hydnum caput-ursi.[1] On a decaying spot in a living beech trunk.
Hydnum ochraceum[2]

4. Polyporaceae

Bjerkandera adusta[1]
Cerrena unicolor[1]
Coltricia perennis[3]
Coltricia tomentosa[3]
Coriolus abietinus[n]
Coriolus versicolor[n]
Daedalea confragosa[4]
Elfvingia fomentaria[1]
Elfvingia megaloma[n]
Fomes roseus[n]
Fomes ungulatus[n]

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Fomitiporia prunicola[1]
Gloeophyllum hirsutum[nn]
Hapalopilus rutilans[1]
Inonotus radiatus[1]
Ischnoderma fuliginosum[n]. The usual form on coniferous logs.
Phaeolus sistotremoides[1]
Piptoporus suberosus[n]
Polyporus elegans[n]
Porodaedalea Pini[n]
Pycnoporus cinnabarinus[1]
Pyropolyporus conchatus[1]
Pyropolyporus igniarius[1]
Scutiger griseus.[1] This was found on a shady bank in coniferous woods. The young pileus was pale-rosy-isabelline, the hymenium white, and the taste mild.
Spongipellis borealis.[1] The specimens were unusually small.
Tyromyces caesius[2]
Tyromyces chioneus[n]
Tyromyces guttulatus[3]
Tyromyces lacteus[2]

5. Boletaceae

Boletinus pictus[nnn]. This beautiful edible species was more abundant than I have ever seen it before. It was difficult to obtain specimens free from insects, even when picked very young.
Ceriomyces affinis[1]
Ceriomyces auriporus[1]
Ceriomyces ferruginatus[1]
Ceriomyces nebulosus?[n]. This rather pretty edible species had been found previously at Lake Placid.
Ceriomyces subglabripes[3]
Ceriomyces viscidus[nn]. Common under birch trees.
Rostkovites granulatus.[5] Two distinct forms of this species were found, the ordinary pinkish form and one which was yellowish throughout, slimy, with a pleasant, slight odor of bitter almonds, a mild taste, and dark-dirty-yellow tubes.
Rostkovites subaureus[nn]. Mostly under pines planted about the camp.
Suillellus luridus.[1] Gregarious at the edge of coniferous woods.
Tylopilus felleus[nnn]. Very conspicuous by reason of its abundance and size. Many specimens were tasted and all were found to be exceedingly bitter.

6. Agaricaceae

Agaricus diminutivus[n]
Chanterel aurantiacus[2]
Chanterel infundibuliformis[nnn]
Chanterel umbonatus[nn]
Claudopus nidulans.[1] At the base of a small dead coniferous trunk. The specimens were young and fresh and were carefully tested by more than one person for a mephitic odor but none was present. I have never noticed such an odor in this species.

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Clitocybe clavipes[n]
Clitocybe eccentrica[3]
Clitocybe infundibuliformis[n]
Clitocybe sinopica.[2] On lawn in the open.
Clitocybe subditopoda[2]
Clitocybe virens[2]
Clitocybe spp.
Collybia acervata[nn]
Collybia confluens[nn]. This species has been transferred to *Marasmius*.
Collybia dryophila[nn]
Collybia maculata[nn]. Always spotted and very bitter even when cooked.

FIG. 2. View of Upper St. Regis Lake from one of the guest houses at Camp Kanosa.

Collybia platyphylla.[2] Under maple and birch.
Collybia radicata.[4] Mostly under beech, attached to the roots.
Collybia scabriuscula[1]
Collybia strictipes?[n]
Collybia tuberosa[n]. On decaying *Lactaria turpis* and possibly other gill-fungi. Several years ago in Maine, I found this species abundant on *Lactaria turpis*.
Collybia spp.
Coprinus fimetarius[1]
Coprinus micaceus.[1] Under birch and maple.
Cortinarius armillatus[nnn]

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Cortinarius erythrinus[5]
Cortinarius lilacinus[n]
Cortinarius purpurascens[2]
Cortinarius semisanguineus[nn]. Attacked by insects when very young.
Cortinarius spp.
Cortinellus rutilans[1]
Entoloma cuspidatum?[1]
Entoloma sericeum[3]
Entoloma strictius?[1]
Entoloma spp.
Flammula penetrans[n]
Flammula sapinea[1]
Flammula spumosa[3]
Galera Hypnorum[2]
Galera tener.[1] On the lawn.
Hygrophorus chlorophanus[1]
Hygrophorus coccineus[n]
Hygrophorus laetus.[1] Several hymenophores of this beautiful species were found in swampy ground between Upper Spectacle and Lower Spectacle lakes.
Hygrophorus miniatus[n]
Inocybe spp. Nearly a dozen species were found, most of them in rather sterile soil in open woods or wood borders.
Laccaria laccata[nn]
Laccaria striatula[n]
Lactaria camphorata[1]
Lactaria deceptiva[nn]. Very large, reaching 8 inches in diameter, dirty-white, cottony on the margin, acrid. This species is found under conifers and takes the place of *Lactaria piperata* found in oak groves about New York City.
Lactaria Gerardii[2]
Lactaria lignyota[nn]
Lactaria mucida[2]
Lactaria oculata[1]
Lactaria parva[1]
Lactaria subdulcis[nn]
Lactaria theiogala[n]
Lactaria torminosa.[3] This poisonous species may be recognized by its zonate surface and conspicuously woolly margin.
Lactaria turpis.[3] An interesting species, very dull in color, occurring in low places in woods and usually attacked by *Collybia tuberosa*.
Lactaria varia[1]
Lactaria spp.
Lepiota amianthina[5]
Lepiota clypeolaria[n]
Lepiota fuscosquamea.[3] This species is very closely related to *L. clypeolaria*.
Lepiota naucina[1]
Leptonia serrulata[2]
Limacella illinita.[1] Under birch trees.

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Marasmius campanulatus[2]
Marasmius oreades.[1] On the lawn.
Marasmius rotula[4]
Melanoleuca albissima[nnn]. Growing gregariously in coniferous woods in large groups covering many square feet and conspicuous at a considerable distance. Many specimens were tasted and all were found to be bitter.
Melanoleuca melaleuca.[2] Found in abundance in one spot at the edge of deciduous woods.

FIG. 3. Some of the guests at Camp Kanosa who assisted in collecting fungi.

Mycena Leaiana[1]
Mycena pura[n]
Mycena spp.
Omphalia campanella[2]
Omphalia chrysophylla[n]
Omphalia fibula[4]

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Omphalia umbellifera[1]
Omphalia spp.
Paxillus atrotomentosus[nn]. Very large and more abundant than I have ever seen it before, occurring on stumps in coniferous woods.
Paxillus involutus[nn]
Paxillus panuoides[1]
Pholiota squarrosa.[1] Abundant on a fallen deciduous trunk.
Pholiota spp.
Pluteus cervinus.[2] Only two small specimens were seen.
Russula albidula[1]
Russula compacta[nn]. Large, edible, free from insects.
Russula depallens?[3]
Russula emetica[n]

FIG. 4. Lower Spectacle Lake.

Russula foetens[1]
Russula foetens?[n]. More common, somewhat smaller, and with less odor than typical *R. foetens*.
Russula lutea?[n]
Russula spp. A beautiful rosy-stemmed reddish species was common everywhere in coniferous woods and also a purplish species with a white stem. Both of these were edible and easily distinguished from *R. emetica*. Several other species were collected which will be determined later.
Stropharia semiglolata.[2] Found sparingly in its usual habitat.
Vaginata plumbea[nn]. The yellowish form of this species was common everywhere. I do not remember seeing the gray form.

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*Vaginata plumbea strangulata*ⁿ. I had an excellent opportunity to study this variety in all its stages and, for this locality, it is apparently entirely distinct from *V. plumbea*. It was not found to vary in color, but Professor Atkinson recently told me that he once collected a yellowish form of it.

*Venenarius Frostianus*ⁿⁿ

*Venenarius muscarius*ⁿ. The usual orange form of northern latitudes.

*Venenarius phalloides*ⁿ. The usual umbrinous form was the common one, just as I found at Lake Placid, while the white form or "destroying angel" was collected only four times. In the vicinity of New York City, the dark form would hardly be noticed during an entire season, while the white form is one of the most abundant fleshy fungi in our woodlands, which accounts for the number of deaths due to its use by ignorant persons.

D. GASTEROMYCETES

Puffballs were not very abundant, if we except *Scleroderma aurantium*, the hard-skinned puffball. In addition to the species listed below, I probably obtained *L. atropurpureum* and *L. pulcherrimum*, as well as two or three other species not definitely determined.

Crucibulum vulgare[1]

Lycoperdon cyathiforme.[1] On the lawn near the camp.

*Lycoperdon gemmatum*ⁿ

Lycoperdon pyriforme[2]

Lycoperdon separans.ⁿ Grassy places in the open.

Lycoperdon subincarnatum.[1] This beautiful species was found in abundance among chips and sticks in a low spot in the edge of mixed woods.

*Scleroderma aurantium*ⁿⁿⁿ. Abundant everywhere under all kinds of trees.

SPECIES USED FOR FOOD

Boletinus pictus
Ceriomyces viscidus
and several other species
Chanterel infundibuliformis
Chanterel umbonatus
Clavaria, several species
Collybia acervata
Collybia dryophila
Collybia radicata
Cortinarius lilacinus
Cortinarius semisanguineus
Craterellus cornucopioides
Hygrophorus coccineus
Hygrophorus miniatus
Laccaria laccata
Lactaria lignyota
Lactaria subdulcis
and several other species
Lepiota clypeolaria
Lycoperdon gemmatum
Lycoperdon pyriforme
Lycoperdon Wrightii
Paxillus involutus
Rostkovites granulatus
Rostkovites subaureus
Russula compacta
Russula lutea?
and several other species
Vaginata plumbea strangulata
Vaginata plumbea

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PRINCIPAL POISONOUS AND BITTER SPECIES COLLECTED

Ceriomyces ferruginatus
Collybia maculata
Lactaria torminosa
Melanoleuca albissima
Russula emetica
Russula foetens
Suillellus luridus
Tylopilus felleus
Venenarius muscarius
Venenarius phalloides

NEW YORK BOTANICAL GARDEN.

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CAMP KANOSA WITH ST. REGIS MOUNTAIN IN THE DISTANCE

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VIEW OF UPPER ST. REGIS LAKE AND SEVERAL OTHERS FROM ST. REGIS MOUNTAIN. MT. MARCY AND OTHER PEAKS OVER 5,000 FEET HIGH ARE VISIBLE IN THE DISTANCE ON THE RIGHT. CAMP KANOSA IS SITUATED ON THE NARROW RIDGE TO THE LEFT OF THE CENTER BETWEEN UPPER ST. REGIS AND UPPER SPECTACLE LAKES

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You're Invited to The Northeast Mycological Federation (NEMF) 2019 Samuel Ristich Foray!

The Northeast Mycological Federation (NEMF) will hold their foray August 1-4 at Lock Haven University in Lock Haven, Pennsylvania. The Federation consists of twenty clubs ranging from northeastern Canada to Pennsylvania and New Jersey. Every year, one or more clubs host the annual NEMF Foray. Attendance at the Foray is open to everyone in the world!" http://www.nemf.org/about-us/

NEMF President Rick Van der Poll reports that "Lock Haven University is a beautiful campus located right on the Susquehanna River about an hour's drive west of Scranton and two hours from Delaware Water Gap. The modern campus has a new dorm where we will be staying (with air conditioning!), a science center with a microscope room and space for all our displays, a sprawling dining hall, and conveniently located classrooms. Most of the foray sites are within a half-hour's drive of Pennsylvania state park and state forest lands, where we have permission to collect and voucher specimens. We will again submit vouchers to the Mycoflora Project and hope to encourage more coordination with collectors and the ID group. There will be concurrent workshops throughout the four-day event, the usual early bird foray on Thursday, and two to three forays each morning and afternoon on Friday and Saturday. There will be the usual evening programs, awards, and the now-infamous mycophagy session on Saturday." The registration form is available here: http://www.nemf.org/2019/03/23/2019-foray-and-registration/

THE MYCOPHILE

Newsletter of the North American Mycological Association

Mother Nature's Inspiration Pg.2

Mushrooms of New York Pg.8

Celebrating Women "Amateur" Mycologists Around The World Pg.12

15.3 May - June 2019 www.namyco.org

San Juan Island naturalist, photographer and mushroom artist Jill Bliss makes masterpieces inspired by Mother Nature

Howard Goltz

"Nature Medley" is Jill Bliss' collection of photographic works created with found and arranged natural objects while she wanders among the islands of the Pacific Northwest, turning wild mushrooms into works of art.

I first came across Jill Bliss' "Mushroom Medleys" a couple of years ago through Facebook postings by "My Modern Met" and was immediately struck by her photographs of colorful mushroom arrangements. I must not be alone, as she has currently has some 30,000 Instagram users following her nature adventures in the Salish Sea, a network of coastal waterways and islands that stretch from SW British Columbia to NW Washington State.

Bliss walks daily in this richly biodiverse ecosystem and turns her transient compositions of local plants and wild mushrooms into the photo art she calls "Mushroom Medleys." *In situ*, she arranges wild fungi into colorful clusters of balanced colors, forms and textures, often incorporating coincidental flora and fauna, takes the photograph, and then leaves the composition behind, intact. Her message is always the same: "Color is everywhere, these beautiful forms and shapes are everywhere. You just have to look."

She says, "You can always tell where I've been. This is kinda like my nature graffiti. I will leave them, I'll leave them be. And people will find them or not." The return of her compositions to the environment created one of her favorite "medley" experiences on San Juan Island. "I went back a few days later and a fox had pooped in the middle of it. That was like the funniest critique I've ever had."

Bliss grew up on a plum and walnut farm in northern California, attended college, studied fashion design and worked in New York, San Francisco and Portland, Oregon. With a master's degree in design theory, Bliss lived in Portland while designing and selling her own products and teaching as an adjunct professor at Portland State University.

"In 2012 I sold most everything I owned and bought a van, embarking on a year-long self-imposed west-coast sabbatical to reconnect with the slower natural pace and living things I knew and adored as a child. That sabbatical year has stretched into a new life chapter – I've been living, working, traveling and exploring amongst the Salish Sea islands of SW British Columbia and NW Washington State ever since. I'm going to live by the sea, in a cabin in the forest," Bliss says. "That was my dream as a little kid."

Bliss currently resides on Lummi Island, where she sells her art prints through her online store, at summer art markets and at art trade shows on the mainland. "In the summer tourist season, I primarily work as a naturalist and deckhand aboard M/V Odyssey in Friday harbor on San Juan Island. Summer is my season for socializing, learning and sharing my knowledge about the natural world here in Cascadia and encouraging visitors to explore and learn about the natural world that surrounds them wherever they live."

"I'm an accidental photographer. My first year making these images as blog posts, I used my iPhone and then upgraded to a cheap DSLR when asked to make prints and notecards. I now have a new fancy Nikon DSLR, but I am using the auto functions until I figure it out. I use a tripod from overhead if I'm able, or handheld overhead if unable to use or bring a tripod. Natural shade is ideal. I don't know how to do digital postproduction, so none of that. I have a ways to go before these images will be high-end professional quality. It's just me and sometimes the dogs out for a walk/hike, no assistant."

Bliss was a member of Seattle-based Puget Sound Mycological Society in the past but living out in the islands, she was never able to attend the events on a regular basis. She hopes to join the Bellingham, WA Northwest Mushroomers Association this year.

Jill's website, <https://www.jillbliss.com/> includes her contact information, dozens more Mushroom Medley images, articles on her work, and sources to purchase Giclée prints and stationary of her photographs and other artwork. She shares at least 10% of her earnings each year with individuals and organizations doing important work in the world.

Fungal Art

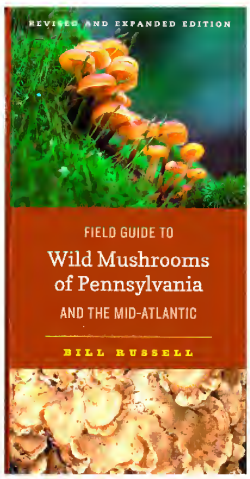
A few months ago, NAMA President Barbara Ching invited me prepare periodic articles for the Mycophile on the subject of "Fungal Art." The intent is to tell the stories of contemporary artists and the wide range of their mushroom-centric work, be it photography, painting, illustration, writing, 3D creations, writings, or even the art of cooking! This is adjunct to NAMA's "Art Registry," which is a listing of historic-to-early-2000s mushroom artwork. As art is in the eye of the beholder, I invite our readership to go beyond what I consider art worthy and contact me with their ideas and references for future articles. Howard Goltz, Recording Secretary, NAMA. <Goltz.Howard@gmail.com>

Captions:

1. 2018 Deep Forest, Lummi Island
2. Jill Bliss
3. 2015 With-Stereum, Cortes Island BC
4. 2017 Red and Gold, Decatur Island
5. 2015 Sorrel, Cortes island, BC
6. 2018 Russula Stack, Lummi Island
7. 2016 Carbon-Antlers, Decatur Island
8. 2016 Russula-Center, Decatur Island
9. 2016 Discovery-Park, Seattle
10. 2016 Wood-Slab, Decatur Island

Field Guide to Wild Mushrooms of Pennsylvania and the Mid-Atlantic (Revised and expanded edition)

Bill Russell



2017; Penn State University Press (www.psupress.org)

ISBN 978-0-271-07780-2 (paper, 284 pages)

$24.95

The March-April 2007 issue of *The Mycophile* contained a review by John Plischke III of the first edition of *Field Guide to Wild Mushrooms of Pennsylvania and the Mid-Atlantic*. In short, he stated that there are a lot of advantages to having a field guide cover few enough mushrooms so as not to overwhelm a beginner, that he liked the convenient size (about 4½ × 9 inches) and the "In A Nutshell" summaries. Overall, he concluded that it was an excellent book for the novice and occasional mushroom hunter. I think Plischke's comments were spot-on, and they apply equally to this revised edition.

The content is typical for a field guide, although the organization and presentation of the species accounts differ from that of most others. After the Preface and Acknowledgments, the introductory Mushroom Basics covers Identifying Features, Mushroom Love, Collecting and Identifying Mushrooms, Gathering Mushrooms, and Identifying Your Mushrooms by Name. Russell's writing is clear, unpretentious and entertaining and he hits most of the points essential for a beginner. Missing, however, is mention of the ectomycorrhizal association when discussing how fungi make their living, and the figure showing the parts of a mushroom fails to include the lower portion of the stipe; as a result, there is no instructive illustration of the important-to-notice *volva* that occurs among species of the genus *Amanita* and a few other mushrooms. Mycophiles love *fungi*, not just mushrooms; mycologists study *fungi*, not just mushrooms. Also, it would have been good to provide a source for the claim that corn smut "may be poisonous when it matures and turns black." I had not heard that before and would find it surprising, if true.

The bulk of the book consists of descriptions of 125 species of mushrooms, organized by season: Spring Mushrooms (16 species); Summer Mushrooms (75); Fall Mushrooms (23); and Winter Mushrooms (11). Handily, the seasonal sections are indicated by colored page-edge tabs. Within each section, the accounts are divided into Gilled (further divided by spore color), Neither Gilled nor Pored, Pored (Boletes) and Pored (Polypores). Most of the species accounts cover a page and a half to two pages. Each account starts with a photo, followed by the common name in a large font and, below that in a much smaller font, appear the scientific name (with authority) and suggested pronunciation of the Latin binomial. Unlike most guides, Russell first provides fairly lengthy commentary covering aspects of the particular mushroom he feels are most important or interesting and, often, some of his personal experiences with it. The commentary typically comprises more than half of the overall species account. It is followed by brief descriptions of the Cap, Hymenium (Gills, Pores, etc.), Spore Print, Stem, Growth Habit (including habitat and fruiting time), Edibility and a Tip. The 25-words-or-less In A Nutshell summaries appear in various locations as sidebars. The species included are nearly all common ones that appear in several other books.

The book is rather narrow (perhaps to fit in a pocket?) and so the photos are not very large, mostly 3 × 2¼ inches. Nearly all are of good quality and show the necessary features reasonably well. I enjoyed the commentary, as it provides a sense for the author and his personality that you can't get from simple recitations of cap and stem dimensions and color descriptions. However, as in most guides, there are scattered errors and misstatements, among the more important of which are as follows: the main toxin in *Amanita muscaria* is ibotenic acid, not muscarine, which is present in very low concentrations (an important thing for medical personnel to know in the event of a poisoning); *Cortinarius gentilis* is not a deadly species (phylogenetic analyses show that it is a very close relative of *C. brunneus*, not of the orellanine-containing species such as *C. orellanus*); the discussion of lookalikes for the edible *Leucoagaricus americanus* (*Lepiota americana*) should include mention of amatoxin-containing *Lepiota* species such as *L. subincarnata*. Less critical issues include incorrect names: it's *Morchella americana*, not *M. esculentoides; Omphalotus illudens*, not *O. olearius* (correct in some places, not in others); *Cantharellus cibarius* and *Lactarius deliciosus* appear not to occur in North America (we have several species that have been going under each of those names and gradually they are being recognized and given their own names); there's no good evidence to suggest the fly agaric (*Amanita muscaria*) actually kills flies; the fertile tissue of boletes should be referred to as tubes, not "pores"; the "aborted entoloma" actually should be called the abort*ing* entoloma, as the deformed blobs are primarily made of honey mushroom tissue; *Suillus granulatus* does not "grow almost anywhere evergreen trees grow in the United States" (it is primarily associated with pines and perhaps with a few other members of the *Pinaceae*, but certainly not with most evergreen conifer and broadleaved trees).

The book concludes with general discussions of Edible and Nonedible Mushrooms and Mushrooms in the Kitchen (including a handful of recipes), an Appendix listing the species by morphotype (gilled, pored, or neither of those), a short list of References and an Index (to both common and scientific names). Throughout the book, I was struck by the number of species that Russell claims that he and his friends consider to be good edibles and that they eat frequently — species that I rarely, if ever, hear anyone else praising, such as *Agrocybe dura* and Russell's favorite edible, *Clitocybe odora;* either these Pennsylvanians are onto something the rest of the country is missing or they have a rather different sense of taste.

From a production standpoint, the book appears well put together with a flexible and seemingly durable cover, but it is notably very difficult to open and definitely won't lie flat.

While I think that most any mushroomer would enjoy this book, I echo the sentiment of John Plischke III that it is best suited for beginners and outdoors folks with a passing interest in mushrooms. The species are ones that are likely to be widely encountered and there is a small enough number of them that people shouldn't get overwhelmed.

Steve Trudell

2018 NAMA BOARD OF TRUSTEES ANNUAL MEETING MINUTES SUMMARY

Prepared by NAMA Secretary Howard Goltz

The following is a summary of motions that were approved at the 11 October 2018 board meeting, chaired by President David Rust, in Salem, OR:

- NAMA has "passed through" a $10,000 gift from Paul Stanets to the Mycoflora project. Additionally, the Board's previously approved "$10,000 NAMA contribution to the Mycoflora Project to be spread over 3 years," was re-affirmed. NAMA has no proposed funding for the Project beyond the $10,000 already committed. Stephen Russell is the Chair of the North American Mycoflora Project, Inc. committee. The project is a registered 501c3 non-profit, operating as NAMA Inc. (NAMINC). MSA has allocated $20,000 in a matching fund for sequencing.
- Barbara Ching was unanimously approved as NAMA President starting 2019.
- Salma St. John was unanimously approved as NAMA First Vice-President starting 2019.
- Regional trustee positions are opening in 2019 for the Pacific North Region (being vacated by Milton Tam) and the Southwest Region (being vacated by Stephen Pencall). It is the responsibility of each Region to select their representative trustees.
- The position of Executive Secretary will be vacated by Barbara Ching (January 2019) as she assumes her new role as President.
- The following Committee Chair positions are opening in January 2019: Education (Kaplan retiring), Membership (Bichler retiring), Cultivation (Spinosa retiring), Toxicology (Beug retiring), and Marketing. It is the President's responsibility to appoint committee chairs.
- The Inter-Society Liaison Committee is suspended until further notice.
- Gary Lincoff will be recognized as the next (2019) Memorial Fellowship honoree, followed by Judy Rogers in 2020.
- The Association of Food and Drug Officials (AFDO) has requested that NAMA provide a peer review of their "Regulatory Guidelines for Wild Harvested Mushrooms 2018." The peer review was approved by the Board, and the NAMA President is to appoint a small committee to conduct the AFDO food safety peer reviews. NAMA's review comments shall be prefaced with a statement that NAMA and its reviewers assume no liability in the review, its accuracy, nor its use.
- NAMA is to form an Ad Hoc committee to survey members and member clubs regarding inclusion and diversity.
- The 2019 NAMA Foray is to be held at Paul Smith's College, Upstate New York Adirondacks August 8-11. The Board unanimously re-affirmed this location and time.
- NAMA Membership Summary for 2018 was submitted by Steve Bichler, Membership Secretary. As of 9/11/2018 we have 1,085 active members.

NAMA Voucher Collection Project

We are seeking students to assist with the NAMA Voucher Collection Project at this year's NAMA foray.

https://www.namyco.org/events.php

NAMA's 2019 Annual Foray will be August 8 to 11 at Paul Smith's College, in the beautiful Adirondack Mountains of upstate New York. The NAMA Voucher Collection Project supports 4 graduate student assistants at the annual NAMA foray. The program is also open to highly recommended undergraduate students. Candidates chosen will be working alongside Andrew Wilson, Voucher Coordinator, as well as other distinguished mycologists and NAMA member volunteers.

http://www.namyco.org/voucher_collection_project.php

NAMA Voucher Collection Project student assistants have their foray registration fees, room and board/meals covered by NAMA (please note that travel expenses to and from the foray, as well as $25 annual NAMA membership dues, are not covered). In exchange, the students work half days each day in the specimen vouchering process and display room; their help may also be requested late into the evening after dinner. Duties include supervising the foray drop-off and display tables and keeping them organized, moving specimens from drop-off tables to recording station, then to photography, then to display tables. Mushroom identification skills are not required but can be very helpful in sorting and determining what specimens merit special attention. Students help with display area set-up on Thursday afternoon/evening, then work in morning or afternoon shifts on Friday and Saturday; late nights are often requested in order to complete the vouchering process for the day's specimens. They then assist with clean-up on Sunday morning. We do our best to spread out the schedule to allow students to attend some lectures and/or forays each day, if they so desire. The program is a lot of work and a lot of fun; the hands-on opportunity to see, study and learn a region's seasonal mycoflora is unparalleled.

More information on the NAMA Voucher Program is also available here: **http://www.mycoguide.com/nama/**

To apply, please submit the following: 1) a one-page cover letter describing your research interests and how they would benefit from your involvement; 2) a brief endorsement from your academic advisor (note: a formal letter of recommendation is not necessary); email these items to Andrew Wilson at andrew.wilson@botanicgardens.org. Please use subject line "NAMA 2019 Voucher Collection Program Application" to help ensure that your application does not get overlooked.

We seek to select the NAMA 2019 Voucher Collection Program Assistants as soon as possible, with the intention of notifying the chosen applicants by early June. Students who are selected will be provided with further instruction on how to register for the event.

New Committee Announcement

It is with great pleasure that I announce the creation of the new ad hoc Mushroom Culinary Arts Committee, as approved by the NAMA Board of Directors at the board meeting on Sunday, March 17, 2019.

This new ad hoc committee will not significantly overlap with the Mycophagy Committee, which will continue the tremendous work it has been doing for many years. The purpose of the Mushroom Culinary Arts Committee will be to promote, advance and share information, art and stories related to the human consumption of mushrooms, including:

- Artistic and skillful ways of preparing, storing, cleaning, preserving and creatively presenting mushroom foods.
- Techniques and healthful methods of cooking mushrooms.
- Relevant research and data related to the specific health benefits of different kinds of mushrooms, including how to test-taste, the safe amounts to consume, potential adverse effects of overconsumption, etc.
- The history of human culinary mushroom consumption (mythology, traditions, cultural significance, etc.).
- Developing joint projects with the Cultivation Committee and partnerships with experts in relevant fields, including commercial enterprises that focus on cultivating exotic mushrooms for consumption, innovations in home mushroom growing, etc.
- Reporting on the latest relevant nutritional research, including global advancements in culinary mushroom use and related issues such as mushrooms as meat replacement, etc.
- Planning cooking demonstrations and contests.
- Photographing culinary events during forays and club meetings to be uploaded on the the NAMA website as a resource for members.

There will be a page for the Mushroom Culinary Arts Committee on NAMA's website and articles in The Mycophile that will include selections from foray events, recipes, cooking demos and articles about the health benefits of and history surrounding the consumption of mushrooms.

As the inaugural Mushroom Culinary Arts Committee chair appointed by NAMA president Barbara Ching, I invite all NAMA members who have interest and/or expertise in any of the aspects of the mushroom culinary arts set forth within this announcement to become committee members. It is my hope that the breadth of vital information encompassed by this new committee will attract a wide range of perspectives to contribute valuably to the enrichment both of NAMA's membership and the larger global mycophile community.

Feeling enticed and excited to be a part of this new committee? Please contact me, Salma St. John, Vice President of NAMA at the following email address: vicepresident1@namyco.org

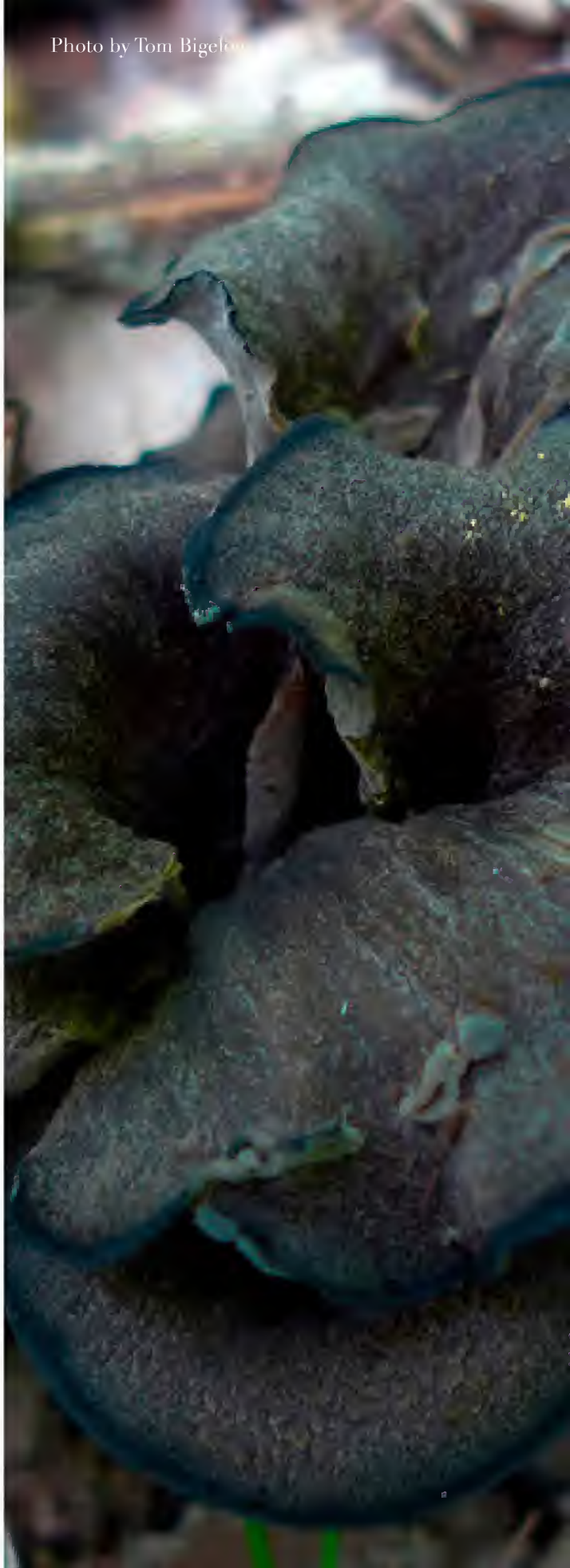


Photo by Tom Bigelow

1.

Mushrooms of New York

Tom Bigelow with Bruch Reed

Tom Bigelow has been a member of the New York Mycological Society (NYMS) for 12 years and is currently honored to serve as that venerable club's President. He is also as active as time and space allow with New Jersey Mycological Association (NJMS), The Long Island Mycological Club, Boston Mycological Club, Maine Mycological Association and, of course, with NAMA. Through NYMS, Tom seeks to raise public awareness of mushrooms and the vital role they play in the environment. He is an avid mushroom photographer, often and ably assisted by his sharp-eyed and equally notable mycologist wife, Juniper Perlis, who finds many of his finest photographic subjects. In 2013, Tom won the New Jersey Mycological Society photo contest, an achievement he remembers all the more fondly because the judge that year was Gary Lincoff.

Tom uses a SONY NEX 5 camera with a 30mm F/3.5 lens.

Captions

1. *Amanita flavoconia* so bright you gotta wear shades! (photo by Tom Bigelow)
2. Peter Piper picked a peck of...*Pycnoporus cinnabarinus*? Well, maybe not but come on -- who can resist picking this velvety vermilion polypore? (also seen on page 11) (photo by Tom Bigelow)
3. The underside *Daedaleopsis confragrosa* is usually what fascinates mycophiles but it's this specimen's thrilling pileus that somehow soothes. (also seen on back cover) (photo by Tom Bigelow).
4. Stately and sensual Chromosera cyanophylla (also cover photo) (photo by Tom Bigelow)
5. Luscious black trumpets (*Craterellus fallax*) lend low and lurid music to the composition of the forest floor. (photo by Tom Bigelow)
6. Nice fresh young old man of the woods (Strobilomyces floccopus). (page 10) (photo by Tom Bigelow)

Photo by Tom Bigelow

Do the Beautiful Photos in this Issue inspire you?

It's time to think about entering the photography contest. Winning photos will be shown at the Paul Smiths foray. See the rules below.

Annual Photo Contest Rules

Eligibility

The Photo contest is open to all mushroomers. NAMA membership is not required to enter. Images that have previously won (including honorable mention) are not eligible. Up to 15 images may be entered per person, with a maximum of 6 in the Pictorial, 6 in the Documentary and 3 in the Judges Option to make a total of up to 15 images. Closing date: All entries must be received by the Contest Director on or before June 8, 2019. Allow at least one week for mailing.

Subject Material

For Pictorial and Documentary, organisms from the Myxomycota (slime molds) and the classes Basidiomycetes and Ascomycetes of the Eumycota ("true fungi") are eligible. For Judge's Option, nearly anything goes, so long as the theme relates to fungi, and fungi are a key element of the photograph.

Entry Divisions

Limited or Advanced. If you won first, 2nd, or 3rd place 2 or more times before then you must enter in the Advanced division, If you won less that twice before you can enter the Limited Division.

Pictorial

This division is for single photos that illustrate the beauty and variety of fungi in form and color. Mushrooms should not be cut or turned over and look natural. Judging criteria include consideration of both technical (focus, depth of field, exposure, lighting, color, absence of distracting elements) and artistic (composition, color, background, lighting) aspects.

Documentary

For single photographs especially suited as illustrations in a field guide of monograph, or for use in a lecture. Emphasis is placed on portrayal of key morphological characteristics such that the usefulness of the image as an identification aid is maximized. Subjects may be shot in the field, laboratory or studio and the photographer has complete freedom to cut, process, manipulate, or orient the specimen in any desired manner to achieve the goal. Close-ups of single features and photomicrographs are acceptable. Judging criteria will be the same as in the Pictorial category but they will be of secondary importance to the overall mycological utility of the photo. Accurate identification of the subject will be a consideration.

Judge's Option

For single photos or series which do not fit into the Pictorial and Documentary divisions. Examples include time-lapse series, ecological relationships of fungi (e.g. fairy rings), fungi with animals, people enjoying fungi, humor, etc.

Awards

Awards- First 2nd and 3rd place will be awarded in Pictorial, Documentary and Judges Option. Honorable Mentions will also be noted for some Pictorial and Documentary photos. This year award certificates will be emailed or given to first through 3rd place winners. Next years contest will have prizes.

Marking, Listing and Submitting Digitals

Let us know if you are entering the limited or advanced division. The digital photos file name should include 3 things, D (for Documentary) JO (for Judges Option) or P (for Pictorial), and you the photographer initials, followed by the Genus and species of the fungi or the title for the Judges Option photo. Digital images may be emailed or mailed on a CD or DVD and will not be returned. Mail images to John Plischke III, 411 Center Avenue, Greensburg, PA 15601 724-832-0271 Fungi01@aol.com

If emailing in images please include your name, address and phone number. Images can also be submitted using free file mailing programs such as http://www.mailbigfile.com/ or Dropbox etc.

Photo of You

If possible please include a photo of yourself, so we can use it to introduce the photographers. This is not a requirement and the photo of yourself is not counted as an entry. It has also been requested that we start to collect data on where the mushroom photo was taken. We don't need gps coordinates, but it would be helpful to have a city/county/park/state name -- something basic to post on the site for future reference.

Celebrating Women "Amateur" Mycologists Around the World

By: Salma St. John, Ph.D., Vice President, NAMA

The following piece was intended for publication in the March Mycophile, in honor of Women's History Month; we interim editors regret and apologize to Dr. St. John for the delay but the spirit of and information within this piece will be equally relevant in any season.

Since March is the month in which women are celebrated for their achievements, it is appropriate to provide a brief synopsis of the first pioneering women *amateur* mycologists and their contributions to mycology.

Because mycology started out as a division of botany (because fungi were perceived as being a part of the Plant Kingdom at the time), many of the early female mycologists either were botanists or else branched out into mycology from the field of natural science (Maroske and May 2018). Like many other disciplines, natural science during the 17th and 18th centuries was dominated by, if not exclusive to, male scientists. Many women were faced with gender prejudice then and were denied access to education. After the Women's Rights Movement (1848-1920), some women managed to gain that education access. However, female students were still struggling to get enrolled in educational institutions, especially the most reputable universities, which were reluctant to welcome them and grant them degrees. For example, after receiving her B.A. from Antioch College (1865) and an M.A. from Wesleyan College (1883), Flora W. Patterson (1847-1928) set her sights on Yale to continue her studies but was rejected because she was a woman. Nevertheless, she persisted unwaveringly and continued to study botany at other institutions; at the age of 47, she became the first female plant pathologist to be appointed by the USDA.

Similarly, other women were determined to continue their mycological endeavors with no formal education or degrees. The era was an opportune time for those women to explore their creative artistry and intellectual capabilities as it coincided with an intellectual awakening sparked by the Age of Enlightenment (Debakesy 2018), which started in Europe and spread all over the world by the end of the 18th century. It was the spread of noble ideas such as liberty, equality, reason, individualism and self-determination that helped to awaken women who were determined to challenge the idea -- propagated by the male scientific establishment -- that women did not have the intellect to tackle scientific pursuits.

Mapping the geography of female amateur mycologists' emergence, as early as the 18th century one could imagine a "silent" or "muted" symphony orchestrated in many parts of the world, including the UK, Germany, Belgium, the Netherlands, France, the U.S., Australia and other countries. Who are these women? Two researchers, Tom W. May and Sara Maroske (2018), produced a very intriguing, long-awaited study on this very subject. According to this study, which traced forty-three women mycologists/taxonomists and their mycological contributions through different time periods, six women who did not receive any formal educational degrees (and are, therefore, classified as "amateur") described new fungal taxa and published articles about fungi prior to 1900. These pioneering "amateur" female mycologists did indeed contribute to the early development of modern mycology. Here is a brief review of those six women based on the Maroske-May study.

Catharina/Katharina Helena Dorrien (1717-1795). Public domain photo

She was born in Hildesheim, Germany and was the first woman ever to name two new fungal taxa: *Lichen centrifugus* var. *major* Doerr and *Lichen centrifugus* var. *minor*. She also authored 5 fungal publications. She was an accomplished teacher, governess, author of children's books, translator, editor, taxonomist and plant illustrator. Dorrien successfully produced a 496-page catalogue covering 1,400 of the plant species in her area using the Linnean classification and nomenclature system. She was outspoken with regard to the role of women in society, advocating that although women needed to learn the household skills necessary for self-preservation and to be independent, they needed to be fulfilled intellectually through readings in history and science, particularly in botany. Dorrien's work, which disappeared in the years after her death, was revived and brought to light by the end of the 20th century after her biography, work, illustrations, and accomplishments were published. Dorrien is considered a celebrated artist and mycologist in Germany today.

Libert was born in Malmedy, Belgium. She was one of the first women plant pathologists and the second woman to name new fungal taxa (200 to be exact) including the genera *Ascochyta* Lib., which contains 34 species. The plant taxa *Libertia* (a genus of the Iridaceae family) and *Libertiella* (an ascomycete) were named after her. The species that ends with her name "Libert" is recognized as a plant pathogen.

Marie-Anne (also Anne-Marie) Libert (1782 – 1865) Photo Source: DocPlayer.net

Libert received her first informal education from nuns. She was then sent to a boarding school in Germany to learn German and the violin, and later she taught herself Latin. Interested in natural science, she observed, gathered, classified and catalogued minerals and plants in Malmedy. Her thorough work in botany earned her recognition and respect. She made contacts with scientists in Belgium and elsewhere and was mentored and encouraged by many such as Alexander Louis Lejeune (1779–1850) and Augustine Pyramis de Candolle (1778-1841). She was one of the first scientists to identify and describe the organism causing the "late blight" disease in potato (*Botrytis vastatrix)* in 1845; her work was later used, developed and renamed (oomycete, *Phytophthora infestans*) as being the cause of the disease by the German mycologist Anton de Bary in 1876. "The Cercle Naturaliste de la Région de Malmedy," founded in 1951, was later renamed "Cercle Royal Marie-Anne Libert" in Libert's honor.

Mary Elizabeth Banning (1822–1903)
Public domain photo

Banning was born in the State of Maryland. She did not receive tertiary education, although it was available to women at that time. During her scientific career, she named 21 new taxa (16 of them were produced in collaboration with Charles Horton Peck (1833-1917), the curator at the New York State History Museum at the time. Those taxa included such genera as *Agaricus*, *Collybia*, *Inocybe*, *Polyporus*, *Russula* and *Tricholoma*, including *Polyporus beatiei* (Banning), *Russula variata* (Banning) and *Tricholoma magnum* (Banning & Peck). For many years, Banning was mentored by Peck, who helped her with her publications and with naming some species she identified (including *Hypomyces banningiae* in 1879). Banning was very interested in natural history and advocated teaching it to children. She produced a book on the fungi of Maryland; although the book was completed in 1888, it was not published and parts of it were made public only when a group of the illustrations with her notes were exhibited at the New York State Museum. In 1994, she was recognized for her pioneering work in mycology when she was elected to the Maryland Women's Hall of Fame.

Mariette Hannon Rousseau (1850 -- 1926)
Public domain photos

Elis (Elisa) Caroline Bommer (1832 -- 1910)
Public domain photos

Bommer described more than 200 new fungal taxa and achieved 35 scientific publications, 14 of which were published before 1900. She had a keen interest in botany and fungi. She and another amateur Belgian friend, Mariette Rousseau, were exposed to great sources of mycological work at that time such as the *Systema Mycologicum* by Elias Magnus Fries, and were given access to the botanical garden in Belgium. The two women had several of their articles published in the *Bulletin de la Societe Royale de Botanique de Belgique*, including one of their papers on Costa Rican fungi. They also produced a *Catalogue des Champignons* (1879) and a report in which they presented the fungi gathered by a Belgian expedition to Antarctica during 1897-99.

Bommer's work also included fungi of the Netherlands. The genus *Bommerella* was created in recognition of Bommer's work.

Annie Lorrain Smith (1854–1937)
Public domain photo

Smith was a lichenologist born in Scotland who named 200 new fungal taxa. She studied French and German and worked as a governess in her early life. Although at age 15 Smith was one of a few female students that attended school in Edinburgh, she was unable to graduate because of the movement against women's rights to higher education. She attended some botany classes but only as an occasional student. Her first new taxon was *Cyclo-derma apiculatum* A.L. Sm. She also named other new taxa from overseas and the UK. She finished and revised the second edition of James Crombie's *Monograph of the British Lichen* (1911). In 1921, she published an illustrated *Handbook of the British Lichens*. Shortly after that, she published a book entitled *Lichens*, which was widely used as a textbook for many decades. She was one of the founders and twice served as President of the British Mycological Society. She was also one of the Linnean Society female fellows.

Due to her outstanding abilities, she was hired to curate Anton de Bary's microscopic collection of fungi. Smith spent the rest of her life working at the Cryptogamic Herbarium but her position was unofficial (paid from a special fund) because of her gender. Later, she was awarded a Civil List Pension in recognition of her contributions to mycology.

To all those incredible female mycologists who came before us, we tip our hats.

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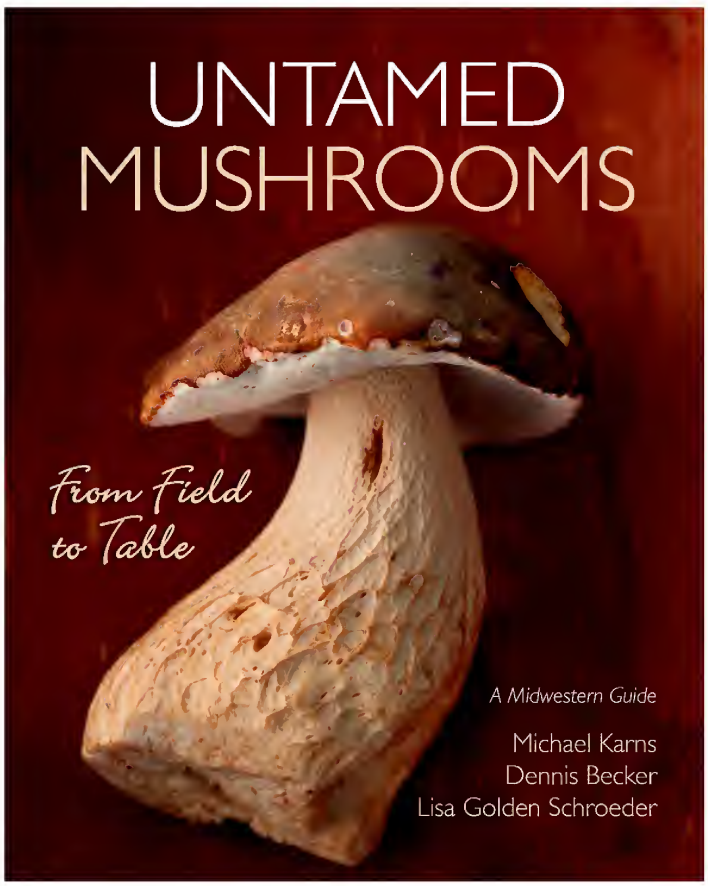
Book Review: *Untamed Mushrooms: From Field to Table* by Michael Karns, Dennis Becker, and Lisa Golden Schroeder. Minnesota Historical Society Press, 2018.



I have yet to tire of picking up, reading, and re-reading favorite sections in this collaborative project by NAMA member Michael Karns, an extraordinary mushroom hunter and excellent writer, skilled photographer Dennis Becker, and food stylist and writer Lisa Golden Schroeder whose cozy prose complements Karns's style nicely. The beauty of this volume is also enhanced by designer Dennis Spohn's drawings.

Published by the Minnesota Historical Society Press, this multi-genre mushroom book works as a field guide to thirteen edible mushrooms of the upper Midwest*, a forager's journal, and a mushroom cooking manual. The first chapter pulled me in by using the term "ethnomycology" in the second sentence; Karns goes on to develop a historical perspective on how we use the mushrooms that surround us. He maintains that "Indigenous peoples in the Midwest are the source of the first truly local cuisine with wild foods at its heart" (1). He then describes the mycophagical (I made up that word) contributions of central and eastern European migrants in the 19th century and concludes the chapter with the amazing culinary vitality the Hmong community. While I am not completely convinced by Karns's claim that Minnesota chanterelles taste better than northwestern varieties (17), my own experience convinces me that our morels are better! Chauvinistic boasting aside, belief in terroir and tradition is this book's organizing theme and rightly so since none of us finds all of the world's edible mushrooms: our daily mushroom hunting is local and seasonal.

Karns's journal entries contain both the most enjoyable and most troubling passages of the book. With a mushroom hunter's furtiveness, he redacts the precise locations of his finds, but records the date, temperature, precipitation, and trees growing in the area as an acknowledgement of the many natural factors involved in mushroom fruiting. (Iowans like to note the soil temperature, too). As Karns writes, identifying your hunting "spots requires a commitment to really understanding a place" (7). At the same time, there is an implicit assumption of stasis, a troubling sense that human intrusion and full baskets won't change anything. Karns makes a blanket statement against harvesting mushrooms that you aren't going to eat or identify (21), but it is hard to square that advice against the large quantities he records from his outings: "In five hours, four of us picked thirty-six pounds of [black] trumpets" (81); "Today . . . one hundred pounds of king boletes. . . . I have to buy a second dehydrator" (93); "a monumental haul of thirty-eight pounds of lobsters earlier today" (113). Still, the most sparkling prose pops up in these sections, too. A hillside bursting with puffballs "looks like it's scattered with skulls" (103).

The cooking section, organized by seasons, is rich with ideas and information—and Becker's droolly full-page photographs of most of the finished dishes. Best of all, you won't be just following recipes—you'll be learning new techniques in the "kitchen notes" section that follows each recipe. Many mushroom-themed cookbooks either add mushrooms to already familiar dishes, offering recipes for tuna noodle mushroom casserole, Caesar salad with mushroom croutons, chocolate cake with mushroom frosting, and so on, and there are a few of those here. But many of Schroeder's recipes start with the mushrooms at hand. For example, the very first recipe, rye berry risotto with tender peas and mushrooms, features morels; Schroeder's note explains that rye pairs especially well with morels (126), an observation I am eager to test for myself as soon as I find some morels.

The recipes I did make have been good enough to stay in the repertoire. After this summer's great lobster season, I made Schroeder's lobster mushroom bacon. Going forward, I will make this after every good find. It's a delicious snack, keeps well, and enhances lots of familiar dishes. I added some to baked beans; Schroeder includes a recipe for brussels sprouts and winter squash that includes them; I'll try to control myself around next year's batch of bacon so I can make this dish, too. The mushroom walnut and lentil burgers were good, too, especially the second day, when they seemed better able to hold their burgerly shape. Schroeder says nearly any type of mushroom will do here; I used maitake and would consider using shiitake another time.

While this book will obviously lure Midwesterners, the photography will appeal to any mycophile, and the cooking section, since it is generally flexible about what mushrooms can be used, would be interesting to any mushroom loving cook.

*In seasonal order

Morels

Pheasant Backs. According to Karns, "they are quite good once one overcomes the expectation that they will taste like other mushrooms" (47). My advice: if you really want to eat these mushrooms, set your expectations by gnawing on watermelon rinds.

Golden Chanterelles

Chicken of the Woods

Oysters

Hedgehogs

Black Trumpets

Lobster

King Boletes

Shaggy Manes

Lion's Manes

Giant Puffballs

Hen of the Woods

Barbara Ching

Oxalates in Chaga – A Potential Health Threat Executive Summary

(see McIlvainea Volume 28 for full article)

By: Michael W. Beug, Chair NAMA Toxicology Committee

In January of 2019, Velma Sterenberg from Yellowknife, Northwest Territories, Canada, inquired about oxalates in Chaga. She collects her own Chaga and makes both tincture and teas. However, she had read Susan Goldhor's 2017 article in *Mushroom the Journal*, in which Goldhor had cited a 2014 Japanese case of Chaga-mushroom-induced oxalate nephropathy.[1,2] In that case, a 72-year-old woman who had been diagnosed with cancer a year earlier had been taking 4-5 teaspoons of powdered Chaga daily for six months. She suffered liver damage and complete, irreversible kidney failure. In Velma Sterenberg's case, she had discovered that consuming both Chaga and high-oxalate foods including spinach, beet greens, and almonds results in zinc deficiency symptoms and makes her worry about osteoporosis.

Before approaching this question, I had no knowledge of oxalates in mushrooms nor did I know how oxalates work as a toxin. Internet sources report either that Chaga has high oxalate levels or extremely high levels, but give no numerical values. I found a paper by Savage, *et al.* in which they examined the soluble and insoluble oxalate content of six different commercially grown mushrooms in Uppsala, Sweden as well as three forest-harvested species (*Cantharellus cibarius, Boletus edulis* and *Hydnum repandum*).[3] All of the species that they looked at were low in oxalates. I had initially been concerned with total oxalate levels, figuring that in the highly acidic stomach, both the insoluble oxalates and the soluble oxalates would be mobilized and thus become toxic. However, the insoluble oxalates (calcium oxalate, magnesium oxalate and iron oxalate) are not absorbed from the digestive system and largely pass harmlessly in the feces. However, soluble oxalates (potassium oxalate and sodium oxalate), release free oxalate anions, which pass into the blood stream. Free oxalates will bind with any free calcium to produce calcium oxalate crystals, potentially resulting in gout, kidney stones and physical damage to the kidneys while depleting calcium needed for strong bones, etc. Free oxalates will also deplete zinc and iron from the bloodstream.

Considering only soluble oxalates, we learn from the Savage paper that in cultivated *Agaricus* species, not only are total oxalates low, but 90% are insoluble. Cultivated *Lentinula edodes* has moderately high total oxalates (just over 1,000 mg/kg DM) but 99% of the oxalates are insoluble and thus harmless to ingest. Cultivated *Pleurotus ostreatus*, in contrast, had moderate oxalate levels but 90% were in the soluble form, making it a moderate overall oxalate risk: a risk level of concern to people with serious gout or serious kidney stone problems but no worse than foods like chocolate, almonds and cereal grains. Nile and Park examined oxalate levels in twenty species of popular wild edible mushrooms.[4] All had very low to moderate oxalate levels. They found no soluble oxalates in *Hericium erinaceus, Sparassis crispa, Boletus edulis* and *Ganoderma lucidum*. The highest levels of soluble oxalate were found in *Phellinus floriada* (65 mg/kg DM) and in *Morchella conica* (60 mg/kg DM) where the oxalate risk would be rated as moderate.

Finding data on oxalate levels in *Inonotus obliquus*, Chaga, proved very difficult; I failed. Fortunately Tim Geho, a NAMA toxicology identifier, succeeded. Glamočlija *et al.* reported on the oxalate levels in Chaga in a sample from Russia (over 3,900 mg/kg soluble oxalates), a sample from Finland (over 5,300 mg/kg soluble oxalates) and a sample from Thailand (over 1,700 mg/kg soluble oxalates).[5] For the Russian material, 97% of the organic acids extracted were soluble and insoluble oxalates. In the Finnish material, 84% of the organic acids were oxalates and 16% was para-hydroxybenzoic acid. In the material from Thailand, a region well outside of the known circumboreal range of Chaga, oxalates comprised only 25% of the organic acids. The main organic acid in the material from Thailand was para-hydroxybenzoic acid (73.6%), with 0.3% gallic acid and 1.1% protocatechuic acid. In all three of these samples, oxalate levels were far higher than those found in other edible mushrooms. However, the Chaga oxalate levels are much lower than oxalate levels found in foods with extremely high oxalate levels like spinach, rhubarb and beet greens.

When I checked the NAMA database (which goes back to the early 1970s), there were no reported cases of poisoning by *Inonotus obliquus*. So was the one Japanese death from oxalate induced kidney failure a unique case or do we have a cause for concern? Are there cases out there that are not reported? It turns out there are. I had drafted a paper for *Fungi* magazine and circulated a draft to all of the NAMA toxicology identifiers. Paul Kroeger responded that he and Raymond Li with the B.C. poison center had worked on nine cases in British Columbia since 2010 and two of those cases involved successfully treated liver and kidney damage, suggesting the involvement of soluble oxalates.

Chaga has become popular and its use is expanding. A search of the internet yields countless entries extolling the virtues of Chaga as a medicinal mushroom and a superfood. Studies of Chaga *in vitro* (lab studies of cultures) and in animals yield some intriguing results that point to the potential for the ability of Chaga extracts to kill cancer cells, stimulate the immune system, and reduce inflammation. One small human study has suggested a reduction in markers for inflammation. None of the other claims for Chaga have been investigated in human clinical trials.

The Memorial Sloan Kettering Cancer Center has a web entry with a well-referenced section on Chaga (https://www.mskcc.org/cancer-care/integrative-medicine/herbs/chaga-mushroom) warning individuals interested in Chaga not to use it if they are taking either blood-thinning medications or diabetic medications.

WebMD (https://www.webmd.com/vitamins/ai/ingredientmono-1474/chaga) warns against taking Chaga if you have an autoimmune disease (*e.g.* multiple sclerosis, lupus, rheumatoid arthritis). This warning due to immune-stimulating β D-glucans. Medicinal mushroom users with an autoimmune disease need to be wary of all of the medicinal mushrooms that are high in β D-glucans.

While there are many interesting anecdotes about positive effects of using Chaga as well as intriguing *in vitro* and animal studies, human clinical trials are lacking; some cautions are clearly in order. For those who do take Chaga teas and/or tinctures and are rightly concerned about oxalates, I discovered that if you take your Chaga (or spinach or any other high oxalate food) with diary products or with highly soluble calcium citrate, the soluble calcium from the dairy products will combine with any soluble oxalate in the stomach and the resultant calcium oxalate will pass harmlessly in the feces.

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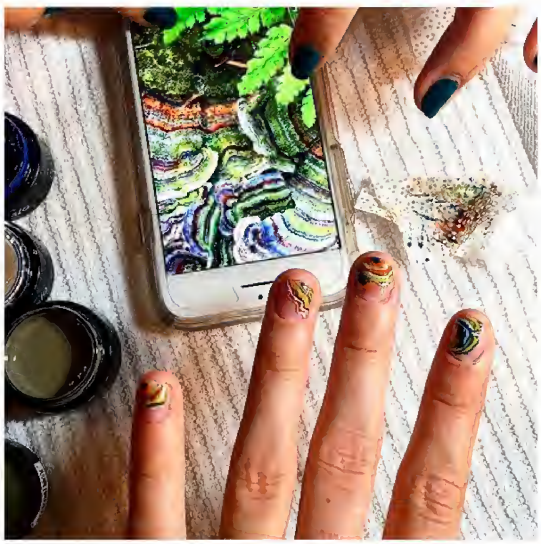

Brie Larson Marvels at Mushrooms As she makes the rounds promoting Captain Marvel, Avengers: Endgame and her earlier movies, megastar Brie Larson talks about the superpowers of mushrooms. She describes herself in her Twitter profile as an "Actor / Mushroom Forager / SCUBA Certified Diver / Scientific American Subscriber / Dog Mom / Captain Marvel." In Men's Journal, she explained to interviewer Sarah Z. Wexler that she fell in love with mushroom hunting after going on walks led by a mycologist. She told The Sydney Morning Herald that she belongs to a "mycological society in Los Angeles." Check out the turkey tail mushroom manicure she flashed on Instagram in 2017: https://www.instagram.com/p/BVVJl-jjkNL/?utm_source=ig_embed #BrieLarson #BrieLarsonMushrooms #BrieLarsonCaptainMarvel

Photo by Tom Bigelow

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THE MYCOPHILE
Newsletter of the North American Mycological Association
On The Decline of Alphataxonomy Pg.6
Fungal Food as Fungal Art Pg.10
Mychorrhizae Explained Pg.14
59.4
July - August 2019
www.namyco.org

NAMA Annual Foray at Paul Smith's College Starts August 8th!

Barbara Ching

We're going to have so much fun and meet so many new mycofolks! As I write this, 214 of you have registered; 72 will be attending your first annual foray! 36 of our clubs have members attending; 28 states (plus D.C.), 2 Canadian provinces and 1 European country are represented. By the time you read this, the foray will be about 90% full — which means you still have time to register. Use this link https://www.namyco.org/2019_nama_paul_smiths_foray.php

And how many mushrooms will attend? While we can never guarantee a bumper crop, conditions are on target for an abundance of our shared obsession; the Adirondacks saw comfortably average rainfall during the month of June (3.65 inches), with July's precipitation forecast by AccuWeather as between 3 and 5 inches – and thunderstorms are predicted toward the end of August's first week!

Bring some treasures to donate to the silent auction, too. This year, we've decided to expand this tradition by encouraging you to bring all sorts of prizes to help raise funds. Of course, mushroom-related items will draw lots of attention but any other items that you think will attract bidders are also welcome. We will use the proceeds from the silent auction to sponsor students attending the 2020 foray.

Start planning your mushroom-devoted days now. Here's the working daily schedule; in a perfect world, it wouldn't change. In our world, though, there's a good chance that some rearranging could happen. The important thing is that we'll have 3 wonderful days to learn more about mushrooms and to be mycophiles together! Here's the perfect thing to wear; order it from the registration link above or buy one at the foray.

Schedule of Events

Thursday, August 8th	
Registration opens 10:00 AM	Joan Weill Adirondack Library
Silent Auction Set Up	Pine Room/ Joan Weill Student Center
Vendors set up 12:00-5:00	Lobby Joan Weill Student Center
Lunch 12:00-1:00 PM	Joan Weill Student Center
Board Meeting 1:00 -3:00 PM	Pine Room / Joan Weill Student Center
Early Bird Foray 3:00-4:30 (Easy)	Red Dot Trail (across from campus entrance)
Early Bird Foray 3:00-4:30 (Easy)	Blue Dot Trail (meet behind gyms, entrance 100 feet down Keese Mills Road)
Dinner 4:30-6:00 PM	Joan Weill Student Center
Friday Foray Sign-Up 6:00-6:45 PM	Pine Room / Joan Weill Student Center
EVENING PROGRAM:	Saunders Sport Complex
Evening Presentation 7:00 PM	
Intro Sam and Barbara 7:00-7:30	Welcome to all.
Andy Wilson, Voucher Committee 7:30-7:45	How and why to voucher your specimen
Rick van Der Poll 7:45-9:00	"Mushrooms of the Great North Woods"
Social/Cash Bar 9:00-11:00	Bobcat Lounge and St. Regis Room/Joan Weill Student Center
Friday, August 9th	
Breakfast 7:00-8:30	Joan Weill Student Center
Silent Auction Open 9:00-9:00	Pine Room / Joan Weill Student Center
Registration Open 9:00-3:00	Joan Weill Adirondack Library
Half-Day Foray 8:30-11:15 (Easy)	TBA
Half-Day Foray 8:30-11:15 (Easy)	TBA
Full-Day Foray 9:00-4:15 (Difficult)	TBA
ALL TALKS IN PICKETT HALL: ROOMS 101,112,113	
Gary Gilbert 9:00-11:30 Pickett 102	Beginner's Class
Tom Huber 9:00-10:10 Pickett 112	Psilocybin-Assisted Psychotherapy: Perspectives & Practices
Rick Van der Poll 9:00-10:10 Pickett 113	Squamanita: Chasing the Fungal Sasquatch through the Adirondacks
Matthew Schink 10:30-11:40 Pickett 112	Ganoderma of the United States
Jan Thornhill 10:30-11:40 Pickett 113	The Big World of Tiny Fungi
Lunch 1:30-1:00	Joan Weill Student Center
Half-Day Foray 1:00-4:15 (Easy)	TBA
Half-Day Foray 1:00-4:15 (Easy)	TBA
John Plischke III 1:00-4:00 Pickett 102/Campus	Photography Workshop
Long Litt Woon 1:00-2:10 Pickett 112	The Way Through The Woods. Of Mushrooms and Mourning.
Bill Yule 1:00-2:10 Pickett 113	An introduction to Mycorrhizal Symbiosis for beginners.

Ethan Crenson 2:30-3:40 Pickett 112 Olga Tzogas 2:30-3:40 Pickett 113	Pyrenomycetes Large and Small (But Mostly Small): Mushrooms + Fungi of Greece
Salma St. John 3:30-4:45	Mushroom Culinary Arts; a demo and tasting / Cantwell 106
Table Talk with an expert 3:30-4:40	Buxton Gymnasium (Collection Room) Various experts
Dinner 4:30-6:00	Joan Weill Student Center
Farm to Table Dinner 5:00-6:30	Reservations required for 25 people $45-$55 The Ganzi Restaurant. Contact
Saturday Foray Sign-Up 6:00-6:45	Pine Room / Joan Weill Student Center
EVENING PROGRAM Barbara/ Sam 7:00-7:25 Andy Wilson 7:25-7:35 Roy Halling 7:40-8:15 Olga Khmelnitsky 8:15-9:00	Saunders Sport Complex Foray Business "Finds of the Day" Mentoring in Mycology – A Bolete Story Making it in Mycology: The High School Researcher Experience
Social/Cash Bar 9:00-11:00	Bobcat Lounge & St. Regis Room / Joan Weill Student Center
Saturday, August 10th Breakfast 7:00-8:30	Joan Weill Student Center
Silent Auction Open 9:00-6:30	Pine Room / Joan Weill Student Center
Full-Day Foray 8:30-4:15 (Moderate) Half-Day Foray 8:45-11:15 (Easy) Half-Day Foray 9:00-11:15 (Moderate)	TBA TBA TBA
John Plischke III 9:00-11:30 Pickett 102	Chemical and Reagent Workshop
Tom Horton 9:00-10:10 Pickett 112 Kay Hurley 9:00-10:10 Pickett 113	Why Suillus and Rhizopogon are very good, or bad, co-invasive species with pine in the Southern Hemisphere. Lichen Identification – Removing the Mystery
Kathie Hodge 10:30-11:40 Pickett 112 Roz Lowen 10:30-11:40 Pickett 113	The Little Fungi in Our Lives Tales of Interesting Ascomycetes
Lunch 11:30-1:00	Joan Well Student Center
Half-Day Foray 1:00-4:15 (Easy) Half-Day Foray 1:00-4:15 (Easy)	TBA TBA
OlgaTzogas/John Michelotti 1:00-3:30 Pickett 102	Hericium Cultivation and Tincture Workshop
Tim Baroni 1:00-2:10 Pickett 112 Sue Van Hook 1:00-2:10 Pickett 113	Hunting Wild Mushrooms in Northeastern North America -- a pleasure not to be missed Regenerating the Soil Sponge: what's mush love got to do with it?
Elinoar Shavit 2:20-3:40 Pickett 112 Walt Sturgeon 2:30-3:40 Pickett 113	Fossilized mushrooms in amber and copal: A fantastic voyage "Appalachian Macrofungi". Some common and uncommon fungi found in the Appalachian mountains and foothills.
Table Talk with an Expert 3:30-4:40	Buxton Gymnasium / Collection Room

Mycophagy 3:00-4:30	106 Cantwell Hall
Dinner 4:30-6:00	Joan Weill Student Center
Silent Auction Ends 6:30	Pine Room/Joan Weill Student Center
EVENING PROGRAM	
Barbara/Sam 7:00-7:20	Foray Business/Announcing 2020 Location
Andy Wilson 7:20-7:30	Finds of the Day
John Plischke III7:30-7:45	Photo Contest Results
Barbara/Walt Sturgeon 7:45-8:00	Awards
Gavin McIntyre 8:00-9:00	"The Future is Grown: Mycelium Materials"
Social/Cash Bar 9:00-11:00	Bobcat Lounge and St. Regis Room/Joan Weill Student Center
Sunday, August 11th	
Breakfast 7:00-8:30	Joan Weill Student Center
Check out of rooms 9:00-10:00	
Collection Walk-around 10:00-11:30	Buxton Gymnasium
Clean up/Depart 11:30-1:00	

Topical *McIlvainea* Publications for 2019

While another wet beginning to summer beckons us to forage, keeping abreast of the exploding interest in all things mycological is equally compelling. *McIlvainea* has received submissions covering several areas. The 2019 volume begins with a cover image of a Taoist master clutching a *Ganoderma*, by the artist Chen Hongshou (1598 – 1652). This is a fitting introduction to two comprehensive papers by Dianna Smith: the first covering the long and complicated history of *Lingzhi* use (or not) in China; the second, a related paper, dealing with the medicinal use of both micro- and macrofungi, especially the poorly understood pharmacological properties of the latter. A related submission is from Michael Beug, Chair of the NAMA Toxicology Committee, on measuring oxalates levels in chaga (*Inonotus obliquus*) as relating to their depletion of calcium in the human body. A voucher report for the October 2018 NAMA foray near Salem, Oregon is given by Dr. Patrick Leacock; 362 voucher collections were preserved from the foray and these vouchers, with accompanying photographic images, are available online at the Field Museum and at **http://mycoportal.org**.

Lastly, we have included a comparative research thesis from Tim Prokesh on oyster mushroom cultivation using wax-coated vs. uncoated cardboard waste.

See the 2019 volume here: https://www.namyco.org/mcilvainea.php

I have also begun scanning back issues of *McIlvainea*. Volumes 1(1) 1972 and 2(1) 1975 have already been posted on the webpage by NAMA President Emeritus David Rust, with a listing of each volume's table of contents. I am delighted to note that these scans are keyword searchable!

The search for content for the current *McIlvainea* volume is ongoing, so authors are encouraged to submit. Submissions will reach me at laurajust54@gmail.com. Instructions for paper formatting are given on the NAMA website under the "Publications" tab, "*McIlvainea* Contribution Instructions."

Laura Juszczak, *McIlvainea* editor

On The Decline of Alphataxonomy

Danny Newman

The following is a rant on the subject of the decline of morphological taxonomy and taxonomists in mycology. The 4% of you still reading may continue to the next line.

We all seem to recognize and agree that there is no longer any job or academic post in the world that will pay a person to go out and look for, find, describe and study fungi, at least not regularly, and not without tacking on a litany of other responsibilities, be they administrative tasks, the teaching or taking of unrelated courses, the writing and obtaining of grants, or self-flagellating upon the altar of impact factor. After 12 years of conversations with people in professional mycology, I've concluded that these add-ons constitute the bulk of their jobs, and that mycology — particularly *field mycology* — is the add-on. Naturally, that can only go on for so long before mycology fundamentally changes, at least in academia, and certain aspects of the field start to change and disappear.

What I see vanishing most rapidly everywhere I look are the classical components of taxonomy. The number of people who can competently put the International Code of Nomenclature (ICN) to use to create new, correct existing, or better govern nomenclature; the number of people who deeply understand and can readily recognize the salient macroscopic, microscopic, chemical and ecological features that are characteristic and diagnostic of one or more fungal groups; the number of people who have a deep working knowledge of past, present and possible future concepts of how their fungi have been/are/will be/should be delimited — is dwindling. People in command of all of those skills, resources and information are sometimes referred to as alphataxonomists. Alphataxonomists, therefore, are dwindling. Of the few who are left, the majority are at or above retirement age (which is when they tend to finally be able to do the work that their academic career perennially got in the way of), and they are seldom being replaced by those imbued with their knowledge and experience.

It is not enough to have any number of dozens or hundreds or thousands of less-experienced people still around when the alphataxonomists go extinct, because the training they received is a necessarily dynamic and interactive process that takes years to complete (if such a thing is ever truly completable). Once these alphataxonomists are gone, it will be much harder than we realize to revive their craft from nothing more than the texts and collections and libraries they've left behind.

The best, briefest exercise I can think of to demonstrate what I mean is to pick a page in this Rolf Singer article: https://www.zobodat.at/pdf/Sydowia_4_0130-0157.pdf

and start reading. You will be outdone and undone by Singer. Almost everyone is. To call his premolecular mastery of macrofungi and their interrelationships "encyclopedic" would be a major understatement. If I could pick three people, living or dead, to spend one day each with, I would spend a long weekend with Rolf Singer. There is undoubtedly overlap in the fungi he and I have observed and collected, having covered much of the same terrain, but being a young and still inexperienced parataxonomist*,

I struggle to lift enough meaning from Singer's fifth-dimensional descriptions and comments to be able to paint a visual picture in my head, and then match that picture to anything I've seen (we won't talk about his drawings). For reasons outside the scope of this rant, I've not been able to appreciate and compare his microcharacters to my own material, but I've no reason to think this would be any easier. One walk in the Andes or Amazon with Rolf Singer could save anyone interested in Neotropical fungi anywhere from hours to years of labor in identifying described species and recognizing novel ones, but to attempt the same with what's *left* of the late Rolf Singer could take a lifetime. It is taking a lifetime — my lifetime.

Singer is far from the sole occupier of this echelon of mycological taxonomy. I use him as an example principally for his proximity to my research interests. Other juggernauts occupy his rank to varying extents in the level of intricacy, vastness, and attention to detail evident in their work.

The commonest cry to put these cares to bed is that the molecules will save us. Like so many weekend-warrior ufologists with hand-painted signs of salvation turned skyward, these blind believers await the day when Sigourney Weaver's great *Avatar* pocket sequencer will come, rendering the shapes and sizes and contours and contexts of things ultimately subordinate to the order of their nucleotides. I too await that day — partly because it sounds a lot less expensive than $10 per forward and reverse read per locus — but I will continue to consider molecular tools and techniques to be precisely that: tools and techniques. Criminology did not stop sketching subjects, taking fingerprints, performing behavioral analyses and building psychological profiles with the advent of DNA sequencing. Forensic science did not wither and die in the shadow of the pipette and thermocycler. On the total and absolute contrary. One came about to enrich, not replace, the other. Why is this not happening in the entire wide-open field of fungal systematics? By what logic can the freight train of mycology disconnect cars from the caboose forward and expect to carry the same amount of cargo? I have no answer.

In practical terms, I am left to ponder, then, what will become of *Entolomataceae* without Tim Baroni, whose position his

university specifically did not wish to renew with a new hire despite him finding and personally recommending a replacement mycologist. His multicontinental collections are now in the process of a great diasporic relocation effort. What will become of *Amanitaceae* without Rod Tulloss, who has funded his own studies and the training of students/assistants directly out of his engineering pension, hoping to give someone the unenviable job of trying to live up to his towering reputation after he's gone? What will become of boletology without Roy Halling, lepiotology without Else Vellinga, or marasmioids, mycenoids, reduced agarics and the untold hordes of little, white-spored, saprotrophic tropical curiosities after Denins Desjardin? Can polyporology survive without Leif Ryvarden? Will anyone be able reliably to discern from one another any of the literal dozens of nectrioid genera without Amy Rossman or Priscila Chaverri to consult? What has become of the study of jelly fungi since the death of Bernard Lowy (answer: almost nothing!)?

Before anyone dreams of placing the blame for the absence of heirs to these alphataxonomic thrones on the shoulders of the outgoing monarchs, ask them how many graduate students they've had, or how many were feasible to take on the more their universities demanded of them, or the more the money dried up, or the thinner the incentives or job prospects became for young people contemplating a 2- to 6-year degree in fungal taxonomy. Ask them how many grants they didn't get even after dutifully reapplying and abiding by reviewer commentary, or how many of them got tenure to study fungi. Chastising our giants for there being no one to inherit their legacies is like blaming a woman from Chernobyl for being unable to bear children. There are real reasons for the disappearance of mycological alphataxonomy, and they are resoundingly NOT the failings of the outgoing alphataxonomists. The reasons are systemic.

I can think of a few people whose lives I am grateful for (and whose deaths I prefer not to think about), which helps to alleviate some of this anxiety by offsetting some of our past and pending losses: Björn Wergen, Roo Vandegrift, Brian Perry, Luis Quijada, *lots* of bright young people in Latin America, people I'm forgetting but whose absence on this list is no indication whatsoever of their not deserving to be here. There are also very, very bright parataxonomists out in the world growing big and strong on a diet of digital literature, discussion fora, and more time out in the field and hunched over the microscope than anyone in academia has been allowed to do for the last half century. But we will be inheriting a different world than the one inhabited by our predecessors, a world in which, if recent history is any indication, there will be less and less science funding to go around by the year, and of what remains, only that which is considered "transformative" by the many-faced funding gods will be given the time of day.

"Transformative" is the National Science Foundation's new one-word criterion for research to be meritorious of public funding. Taxonomy is largely not considered to be "transformative" enough to meet the bar, and so it is increasingly left out in the cold. When taxonomy forms a part of a grant it is basically hitchhiking, brought aboard out of what often feels like pity. Perhaps the dumbest part of this new dressage course for scientists is the apparent failure on the part of the NSF — to say nothing of other funding bodies which follow the NSF's lead — to appreciate what transforming *is*. Transformative science, by definition, calls upon untransformed, naturally occurring, preexisting *things*, in order that our understanding of these *things* may be *transformed*. Taxonomy, and exploratory fields like it, *are the providers of these things*, the *prima materia*, for any transformations that are to follow. We make possible the first variable on the left side of the equals sign in the transformative science equation of multiplying, dividing, subtracting and adding *things* to get *new results*. The discovery, manufacture and distribution of penicillin necessarily required not just information on how *Penicillium* works, but the knowledge that *Penicillium* ***is a thing in the first place***. Sometimes the fundamentalness of a thing can make it almost invisible, taken for granted, while its absence would be instantly and universally felt. Take a look at old episodes of the *Pyramid* or *Password* game shows and watch the brains of full-grown, educated, human adults turn to momentary mush when tasked with making their teammates recite a word that they themselves cannot utter aloud. Imagine a pre-Internet city with no phone books, or as Roo Vandegrift envisions in the cover illustration, all the goods in a supermarket with no aisles or labels. Restricting science funding only to those who are pursuing or can promise transformativeness in their research is akin to rewarding hips for being taller than feet.

I have no great proclamations or predictions for what to do with this world the more that we careen toward it. In all honesty, I experience double as much existential dread as joy in this field with my small place in it. It will never pay my bills or those of my fellow (para)taxonomists without great compromise, the objects of our curiosity are in as much trouble as most living things on Earth, and natural history writ large is being relegated to museums that are being literally set on fire by governmental contempt**.

It will be a curious thing if we who truly, carefully study living things out in the world go extinct before our subjects do. I always pictured taxonomy riding a final crescendo as life and habitats started to sundown out of existence, but it's sadder, and perhaps more realistic, to imagine a near future in which we vanish first, unnoticed except by each other, as human civilization moves further and further away from the sort of conditions that produced a love of nature for its own sake, and more toward the constant panic and fever of survivalism, of last-minute solution-seeking. The irony is how crucial the quaint, antiquarian, naphthalene-

scented taxonomist could be to those species- and society-saving solutions, and how inherently — and regrettably — human of us it will be not to have realized that until it's too late.

[*: *'parataxonomy' is defined by Wikipedia as "the use of less qualified assistance to taxonomists in the practice and science of classification."*]

[**: *see* https://www.mintpressnews.com/the-price-of-austerity-rio-museum-destroyed-by-fire-dry-hydrants/248749/]

Danny Newman is a parataxonomist and photographer primarily interested in the systematics of Andean-Amazonian fungi. He has provided research assistance to graduate students of San Francisco State University, SUNY College of Environmental Science and Forestry, and Oregon State University, and has presented at workshops, academic conferences and mycological societies throughout the western hemisphere. Newman is currently a curatorial intern at the Cornell Plant Pathology Herbarium in Ithaca, New York. His photographs can be found at myxomop.smugmug.com and on Instagram (@kallapmpero), with detailed observations at MushroomObserver.org.

Invitation to Join the Continental Mycoblitz 2019

Explore, Discover and Contribute to Fungal Biodiversity Knowledge

By: Stephen Russell

A first-of-its-kind event will take place the week of August 12-19th – a North American continent-wide online mycoblitz. You may have heard of a "bioblitz" – an intense and usually time-limited survey of all the organisms living in a given geographic area. A mycoblitz is a similar survey, with the focus solely on fungi. An innovation of this mycoblitz will be that it will be coordinated online. Individuals anywhere in North America, from the Atlantic to the Pacific, from Canada and Maritimes to Mexico, will be documenting the biodiversity of fungi in their local area and submitting select specimens for DNA analysis.

The process to participate is easy and anyone who is willing to make scientifically valuable collections of mushrooms can join in. Begin by taking geotagged color photographs of an interesting mushroom, document some basic field notes on a numbered field data slip, upload your images to the iNaturalist project created for this event and submit the dried specimen to our processing center. You can participate on your own time schedule and from your favorite local hunting grounds over the course of the week of the event. Mark your calendars to collect fungi in your area and be a key player in the first-ever continental-scale online mycoblitz. You will have the ability to make a personal contribution to our understanding of the biodiversity of North American fungi by submitting data and dried collections to this project.

How to Participate

The North American Mycoflora Project (www.mycoflora.org) has the goal of documenting all species of macro (visible) fungi across North America. More collections of more novel species are needed to make substantial progress toward the goal. The National Geographic Society is funding the Continental Mycoblitz 2019 in order to expedite the rate of species discovery. More than 2,000 fungal specimens already have their DNA sequenced and housed in herbaria. All NAMA members and members of the general public, whether currently involved in a Mycoflora Project or not, can contribute ten of the most interesting specimens they find during the course of the event.

What Mushrooms Are We Looking For?

The short answer is anything "interesting" or "unusual." Possibilities may include species that are locally uncommon or rare, species with odd morphology, or observations where a genus or species name cannot be applied from photographs alone. Our skilled foray identifiers will make the final determination on the most interesting 2,000 collections from the pool of specimens that are sent in.

DNA sequencing will be focused toward specific taxa during this event: *Cortinarius, Inocybe, Amanita sect. Vaginatae, and the Marasmiaceae*. We estimate that 20-30% of the total number of specimens selected for sequencing will come from these groups, as they have many unknown and undescribed species. Please help us better understand these taxa by including a few specimens in your submission.

Benefits of an Online Mushroom Foray

The Hoosier Mushroom Society (Indiana) began work on a DNA-based biodiversity survey in 2015, with the goal of having a "reasonably comprehensive" survey of all the macrofungi that exist within the state – and to accomplish this goal within a 10-year timeframe. The limiting factors for making substantive progress towards the goal soon became clear; both the number of recently vouchered specimens available and the rate which new vouchers were being retained was too low. Traditional mushroom forays were never going to bring in enough specimens

from a large enough geographic region. A new model for broadly engaging club members and for conducting biodiversity research was required.

Starting in the fall of 2017, the organization began holding "online forays" – week-long collecting events that allowed any individual to photograph and collect mushrooms, upload the metadata online, and to submit the specimens for DNA sequencing. The first event surpassed the goals of the organizers, garnering over 1,300 observations of macrofungi from across the state during the week of the event. Most importantly, over 800 of those observations were associated with dried physical specimens that were sent to Purdue University's Kriebel Fungarium. Over 500 of these specimens were ultimately retained in the fungarium and their DNA was sequenced.

The benefits of this type of event for the Mycoflora Project were clear: it reduced or even eliminated the costs of attending a foray for the average participant, as individuals did not have to travel to a single physical location at a specific time to make a meaningful contribution. Distributing the collecting efforts broadly across the entire state allowed more prime terrain to be covered – areas with local environmental conditions that brought out more mushrooms – meaning a higher diversity of species was recorded. Finally, the low barriers to entry for the event started many new people down the path of regularly drying collections of interesting mushrooms they were already photographing. Ultimately, these events drove an increase in the amount of biodiversity being documented across the state of Indiana. The contintental mycoblitz can do the same for the continent of North America.

Join the Project!

If you are interested in participating, we ask that you take a few minutes to register for the event, complete the brief training modules and join the project on iNaturalist. During the foray week, you can help us to identify observations that are uploaded from your own locality, submit your own dried collections or just follow the interesting specimens that are encountered. It will be a fun week of collecting for all involved!

We hope to see your name among the leading contributors to the event!

Call for nominations for Boreal Regional Trustee

The Boreal region, currently encompasses two Canadian provinces, Alberta and Newfoundland and Labrador needs a Regional Trustee. Regional trustees serve 3-year terms and have the following responsibilities:

The Regional Trustee acts as the liaison between NAMA and the mycological clubs (both affiliated and unaffiliated) in his or her region. The responsibilities of the Regional Trustees - within their regions - are:

1. to promote the growth and development of NAMA

2. to work with the affiliated clubs as follows:

a. arrange to have club events posted on the NAMA Website.

b. send NAMA information to the clubs for publication in their newsletters, websites and message boards.

c. request clubs to place a link to the NAMA website on their websites and message boards.

d. encourage clubs to have their members join NAMA and add NAMA membership applications to their membership drives.

e. work with the NAMA Membership Secretary to collect the NAMA club dues in a timely manner.

3. to identify and contact each non-affiliated mycological club and encourage it and its members to join NAMA, and provide any necessary assistance and/or paperwork.

4. to submit an annual report to the Board of Trustees.

Please contact First Vice-President Salma St. John (vicepresident1@namyco.org) if you wish to volunteer or to nominate someone.

Fungal Food as Fungal Art

Howard Goltz

This article is in concert with the mission of NAMA's newly formed ad hoc Mushroom Culinary Arts Committee, which was formed to recognize and celebrate artistic and skillful ways of preparing, storing, cleaning, preserving and creatively presenting fungal foods. (Contact Salma St. John, Committee Chair with your interest: salmastjohn@charter.net)

Most, if not all, NAMA members like to eat mushrooms: flavorful, aromatic, nutritious, wild and organic. Anthony Michael Blowers takes all that sensory luxury a step further and makes mycophagy beautiful. Can you say "art?" He is a self-taught photographer and wild-food fanatic – especially when it comes to featuring mushrooms in the recipes.

I've been following Anthony's Facebook postings and continue to be amazed by his creativity in combining foraged edibles into beautiful gastronomic delights. Following is a visual sampling of his recipes and presentations. You are invited to join his 24,000+ member Facebook Group: "I Love Wild Mushrooms!" or his personal Anthony Michael Blowers Facebook page to view more of his artistry with fungal foods, beverages, soups, salads, appetizers, mains and desserts! **Be inspired! It's summer, keep looking and get cooking!**

Anthony Michael Blowers, photographer and mycophile from South Haven, Michigan, 'capturing' *Trametes lactinea* at Fort Cooper State Park, Florida

Anthony says: **"Get lost in the forest and you will find yourself.** I've been into mushrooms as long as I can remember and I'm very passionate about what I do with them. It brings me great joy. I'm self-taught, have no formal training other than working at a Mexican restaurant years ago. I'm just winging it most of the time and try to keep things as natural and simple as possible."

"Chanterelle-apricot Cocktail"

Chant-infused vodka, apricot nectar, chant syrup, a splash of club soda, apricot slice and candied red chanterelle for the garnish.

"Chanterelle-infused Vodka"

"Morels and Ramps 3 Ways"

1) Stuffed morels with goat cheese (and some cream to make it smooth), lump crab, minced ramps, wild mustard, smoked paprika, sea salt and lemon juice. Roll the stuffed bundles of joy in flour, dip into egg wash, then bread crumbs. Use vegetable oil for frying.

2) The bisque is made with heavy cream, freshly picked morels, lump crab, chicken stock, caramelized ramp bulbs, ground wild mustard, pink Himalayan salt, thyme, smoked paprika, lemon zest and a splash of cooking sherry.

3) A "yard salad" made with dandelion greens, chickweed, wood sorrel, wild violets, and a morel-ramp vinaigrette.

"Today's Hike Pickled in a Jar

Pino Grigio-Poached *Hericium* with Hollandaise Sauce

Pheasant's back mushroom (*Cerioporus (Polyporus) squamosus*), ramps (*Allium tricoccum*), ostrich fern (*Matteuccia struthiopteris*), hairy bittercress (*Cardamine hirsuta*), and purple/white violets. The brine is made with rice wine vinegar, apple cider vinegar, pink Himalayan salt, green peppercorn, ground wild mustard seed, agave nectar, and California bay leaf. The pheasant back mushroom and ferns were simmered in the brine prior to canning – and used later in spring rolls.

"Spring Rolls with Pickled Pheasants Back"

"Chicken of the Woods Quesadillas" made with huitlacoche (*Ustilago maydis*) corn tortillas

"Wild Alligator with Black Trumpets" with white rice, green onion, cilantro and lime, rolled in a banana leaf and steamed.

"Skillet-Seared Venison Tenderloin" with roasted baby potatoes, steamed morels, broccoli, goat cheese and a wild grape/port reduction

"Steamed Sunfish" with milkweed pods, pickled *Clavulinopsis fusiformis* and oyster mushrooms

"Candy Cap Snow" is inspired by Woodland Keep. Freshly fallen snow drizzled with candy cap mushroom syrup, garnished with pomegranate seeds and spruce tips.

"Candy Cap Crepes with Chanterelle
Apricot Marmalade and Mayapple Mascarpone"

Second in a series: NAMA President Barbara Ching invited me prepare periodic articles for the Mycophile on the subject of "Fungal Art." The intent is to tell the stories of contemporary artists and the wide range of their mushroom-centric work, be it photography, painting, illustration, writing, 3D creations, writings, or even the art of cooking! This series is adjunct to NAMA's "Art Registry," which is a listing of historic-to-early-2000s mushroom artwork. As art is in the eye of the beholder; ***I invite you to contact me with what you consider "mushroom art " ideas for future articles****. Howard Goltz, Recording Secretary, NAMA: Goltz.Howard@gmail.com*

Mycorrhizae Explained

By David Rust

The first single-celled fungi appeared on planet Earth nearly a billion years ago. By the time plants colonized land in the Silurian (443 to 416 million years ago) and Devonian periods (419 to 359 million years ago), fungi in the phylum Mucoromycota had developed an arbuscule, a tree-like structure capable of colonizing plant cells and exchanging nutrients. This evolutionary step resulted in the first plant-fungal symbiosis, known as arbuscular mycorrhiza. Arbuscules can be found in fossils from 450 million years ago; these ancient structures are very, very similar to arbuscules we see today.

Mycorrhizae are present in 92% of plant families (80% of plant species). Plants allow, and indeed require, mycorrhizal fungi to colonize their roots. In this symbiotic relationship, fungal hyphae greatly expand the ability of plants to obtain nutrients and water. Fungi break down organic matter and weather mineral surfaces and, in so doing, collect essential nutrients such as nitrogen, phosphorus, potassium and nearly a dozen other minerals.

The majority of vascular plants are mycorrhizal: 72% are arbuscular mycorrhizal (AM), 2.0% are ectomycorrhizal (ECM), 1.5% are ericoid mycorrhizal and 10% are orchid mycorrhizal. Just 8% are completely nonmycorrhizal (NM), whereas 7% have inconsistent NM–AM associations. Most NM and NM–AM plants are nutritional specialists (e.g. carnivores and parasites) or habitat specialists (e.g. hydrophytes and epiphytes) (Brundett, 2018).

Let's look at three major types of mycorrhizal relationships: Ectomycorrhizal, Arbuscular (often formally referred to as Vesicular-Arbuscular) and Ericoid. There are structural and functional differences between these types, including how they colonize roots, the resources they provide and the types of plants with which they partner. (See Chart Below)

Ectomycorrhizae: Ectomycorrhizae (ECM) are generally host specific, having evolved over the past 200 million years with their plant associates. Most ECM fungi are basidiomycetes, forming fleshy fungal bodies. In this mycorrhizal type, hyphae cover the root tip with a mantle structure and then form a Hartig net, which penetrates into the space between the root's cortical cells. Smith and Read describe the Hartig net as a labyrinthine inward growth of hyphae between the epidermal and cortical cells. As the colonized root hairs grow and harden, the association becomes untenable in 2 to 5 years' time. Hyphae constantly need to renew connections on new root growth.

ECM associations are generally with pines and hardwoods (gymnosperms and angiosperms). Even though they only represent 2% of mycorrhizae, ECM fungi colonize commercially valuable trees and produce edible fungi, vastly expanding their importance to humans. In the northern temperate regions, plants such as pine (*Pinus*), spruce (*Picea*), fir (*Abies*), poplar (*Populus*), willow (*Salix*), beech (*Fagus*), birch (*Betula*) and oak (*Quercus*) typify the ECM association. In total, 140 genera in 43 plant families have been identified as forming ECM.

Ectendo- and Arbutoid Mycorrhizae: Two additional types of mycorrhizae (plus five more minor variations) should be noted, having characteristics of ectomycorrhizae with a high degree of intracellular penetration.

Ectendomycorrhiza: occurs primarily on *Pinus* and *Larix* and is distinguished by the fact that, in addition to a usually thin fungal mantle and well-developed Hartig net of the ECM type, the epidermal and cortical cells are occupied by intracellular hyphae (Smith and Read, 2008).

Arbutoid: found in ericaceous genera *Arbutus* (a genus of 12 accepted species of flowering plants in the family *Ericaceae*) and *Arctostaphylos* (a genus of plants comprising the manzanitas and bearberries) and genera of the ericaceous subfamily *Pyrolae*. It is distinguished

Ectomycorrhizal	Arbuscular	Ericoid
Hartig net and mantle, intracellular colonization	Arbuscules and vesicles in root cortical cells	Colonize epidermal cell, forming dense hyphal coils
Connections last 2-4 years or more	Arbuscules last 4-15 days	Hair root associations are ephemeral
Mainly provides Nitrogen and Phosphorus, and 12 other nutrients	Mainly provides Phosphorus and Nitrogen, Sulfur, Copper, Iron and Zinc	Mainly provides Nitrogen, Phosphorus and Iron
Colonizes 2 Gymnosperm lineages and 28 Angiosperm lineages	Colonizes vascular plants, mainly found in grasslands	Colonizes dense fibrous roots of ericaceaous plants
Basidiomycetes and some Ascomycetes	Glomeromycota	Ascomycetes and some Basidiomycetes
Long branching hyphae	Thin hyphae	Short hyphae
Temperate, boreal, Mediterranean, and some tropical forests	Tropical and temperate forests, grasslands, agricultural crops	Heathlands, tundra, boreal and temperate forest understory

from the ectendomycorrhizal category by the restriction of intracellular penetration to the epidermal layers of the root and by the involvement of a distinct suite of largely basidiomycetous fungi more often found as ECM symbionts of trees (Smith and Read, 2008).

Arbuscular Mycorrhizae: Fossil evidence from the Devonian Period reveals a structure that looks exactly like modern AM fungi. Although the current theory is that plants and fungi arrived on land about the same time, Dr. Joey Spatafora postulates that arbuscular fungal bodies may have preceded plants. AM is thought to have a monophyletic origin in the Ordovician Period, approximately 480 million years ago (Redecker et al., 2000; Delaux, 2017), and is found in the majority of land plants occupying virtually all ecological niches (Read, 2002; Wang and Qiu, 2006).

AM fungi are characterized by the formation of unique structures—arbuscules and vesicles—by fungi of the phylum Glomeromycota. AM fungi help plants to capture nutrients such as phosphorus, sulfur, nitrogen and micronutrients from the soil. AM fungi deliver about 90% of the phosphorus and 50% of the nitrogen needed by the host plant.

Arbuscules are short-lived structures (4 to 15 days), which provide nutrient transfer. Phosphorus is actively transferred to the plant throughout the life of the arbuscule. One reason for the short life of arbuscules could be that because their host plants grow so quickly, fungi constantly need to recolonize new roots.

After the first arbuscules degrade, structures called vesicles often form within the colonized root. Vesicles, the second characteristic structure of AM mycorrhizae, are thick-walled structures. Vesicles contain large amounts of lipids and often numerous nuclei. In dead root fragments, vesicles can act as propagules and regrow hyphae to colonize new roots (Smith and Read 1997). The hyphal network is relatively long-lived and is able to colonize new roots as they enter its domain.

No convincing evidence has been presented to suggest that AM associations are specific. Lack of specificity is indicated by the fact that, globally, only around 300 to 1,600 AM fungal taxa associate with about 200,000 plant spe¬cies. In fact, in nature, plant roots are usually simultaneously colonized by multiple AM, which colonize several plant individuals at the same time, often from different species (Walder, 2015). AM fungi colonize not only grasslands and cultivated agricultural plants but also trees such as maples, cedar, redwood and sequoia.

Ericoid Mycorrhizae: Ericaceous plants are generally found in the understory of a forest. They can also be found in alpine ecosystems and bogs in nutrient poor soils. We know ericaceous plants along the West Coast as huckleberry, manzanita, madrone and native rhododendron. In northern states, they're represented by cranberries and blueberries. On the East Coast, ericaceous plants include magnolia and catalpa.

Plants in *Ericaceae* have dense fibrous roots terminating in a structure called "hair roots." Because hair roots are delicate structures, these mycorrhizal associations are relatively short-lived. Ericoid mycorrhizae (ERM) are characterized by the formation of intracellular hyphal coils in the epidermis of hair roots and hyphae extended up to 1 cm from the root surface (Read, 1984). ERM typically lack multilayered hyphal mantles.

Author's note: the next installment of this series will include more on how mycorrhizal connections work, the evolution of mycorrhizal fungi and their partnerships with soil bacteria.

A Helpful Glossary Reference

arbuscule – a highly branched ("little tree") structure that grows inside a plant's cell wall but outside the plant's plasma membrane.

ascomycete – a fungus having spores that develop within asci. The ascomycetes include the fungal component of most lichens as well as a few large forms such as morels and truffles. Ascomycota is the largest phylum of the kingdom Fungi, with over 64,000 species.

basidiomycete – a fungus having spores that develop on a basidium; a group of higher fungi that have septate hyphae, including rusts, smuts, capped mushrooms and puffballs.

ephiphyte – a plant that grows above the ground, supported nonparasitically by another plant or object and deriving its nutrients and water from the air.

ericoid – resembling heath. The *Ericaceae* are a family of flowering plants, commonly known as the heath or heather family, found most commonly in acid and infertile growing conditions.

Hartig net – a network of inward-growing hyphae that extends into a plant's root, penetrating between the epidermis and cortex. The Hartig net is named after Theodor Hartig, a 19th-century German forest biologist and botanist.

hypha – (**hyphae** is plural) a long, branching filamentous structure of a fungus. In most fungi, hyphae are the main mode of vegetative growth and are collectively called "mycelium."

hydrophyte – a plant that grows in water or very moist substrate; an aquatic plant.

monophyletic – a group of organisms descended from a common evolutionary ancestor.

mycorrhiza (**mycorrhizae** is plural) - a symbiotic association between a fungus and a plant. The term '**mycorrhizal**' refers to the role of the fungus in a plant's root system.

rhizosphere – a plant's root system and the narrow region of soil that is directly influenced by root secretions.

vesicle – a structure within or outside a cell, consisting of liquid or cytoplasm enclosed by a lipid bilayer.

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NAMA Wildacres Regional Foray

The 2019 Wildacres Foray is scheduled for Thursday September 26 through Sunday September 29. This foray, continues in its twenty-second year, and remains one of the most desired destinations for fungiphiles. Wildacres Retreat, located just off the Blue Ridge Parkway near Little Switzerland, North Carolina, not too far from Spruce Pine, is renowned for the identification of new species to the foray, each year, and to the identification of new species to the mushroom kingdom. As an attendee, you will have the opportunity to search for fungi along the creek sides of Armstrong Creek, Linville Falls, and Crab Tree Falls, in the highlands of Mount Mitchell, and in many other areas along the beautiful Blue Ridge Parkway.

Dr. Brandon Matheny returns as our chief mycologist for this year. Dr. Matheny received his PhD from the University of Washington in 2003, and is currently an associate professor at the University of Tennessee-Knoxville. He and his students have studied and explored the fungal world across the county, with a focus in the Southern Appalachians, but also have ventured to Australia and South America.

Interested parties, please see http://www.wildacres.org/ for more information about Wildacres Retreat. Registration for this event is $260, per person, and includes three nights lodging and eight meals double occupancy. There are no private rooms available. This foray is limited to 40 NAMA members. Registration is expected to fill quickly. PLEASE PLEASE PLEASE date your check for September 26, 2019. Checks will be deposited following the foray.

Registration is nearly full. Before sending form, please contact registrar Glenda O'Neal, by email: glendakoneal@yahoo.com, or by phone (423) 863-2742. https://namyco.org/docs/Wildacres_Registration_2019.pdf

MAW Weekend Foray at Sequanota

Mycological Association of Washington, DC's annual Sequanota Foray weekend has been a club event for ~35 years. Please come out, and join us in the Laurel Highlands of Southwestern Pennsylvania for our annual trek to Sequanota PA, and enjoy a full weekend of mushrooming activities.

Weekend forays are a great opportunity to quickly advance your ID skills, get to know other mushroom enthusiasts, and have a lot of fun. Our guest mycologist this year will be the esteemed mycologist Dr. Timothy Baroni, a recently retired professor from the State University of New York (SUNY) Cortland, one of the top mycologists in the Northeast, as well as the author of 'Mushrooms of the Northeastern United States and Eastern Canada'. This year's foray is going to be memorable.

This year's event will be held on September 27-29; For additional details, including pricing, please click on the event link below. http://www.mawdc.org/event-3390173

The Gary Lincoff Memorial Foray

The Gary Lincoff Memorial Foray will be held on Saturday, September 21st : Rose Barn, Pearce Mill Rd, North Park, McCandless Township, PA, 15101. We plan to combine this with a walk and mushroom collection in Cook Forest State Park on the Friday. Guided morning walks and self-guided afternoon mushroom walks; Mushroom Walks will be conducted in North Park and in other woodlands nearby Lectures: guest speakers: Adam Haritan, Bill Russell and Rick Kerrigan; Mushroom Feast; merchandise sales and silent auction. https://wpamushroomclub.org/wp/WP_Forms/WPMC-foray-form-19.pdf.

Upcoming Forays and Other Events. The events page of the Mycophile publicizes forays and events of NAMA affiliated clubs which may be of interest to our members. If you would like to list your club's next big event, contact Karen Monger, Editor: mycophile@namyco.org. Include date, location, brief descpition, link for information, and host organization name.

Letter to the Editor

To the Editor of *Mycophile*:

Danny Newman's essay "On the Decline of Alphataxonomy" (*Mycophile*, July-August 2019, 59(4):6-8) may well have been titled "Postmortem on a Paradigm." The paradigm in question is traditional taxonomy practiced by field mycologists. The decline of Alpha taxonomy is seen by Mr. Newman as a failure to preserve and perpetuate expertise in the systematic classification of fungi based on direct, life-long field experience in our reconnaissance of nature. What Mr. Newman has described so urgently is really an epistemological crisis, a crisis in mycological knowledge, in itself a symptom of the more profound crisis of science and civilization. The alarm was sounded decades ago. See, for example, E. O. Wilson's "The Plight of Taxonomy" from 1971: "Taxonomists have been all but excluded from many of the best biology departments in this country, often to be replaced – if at all – by biometricians who occupy themselves more with the philosophy and methodology than with the substance of taxonomy. In the fashion rankings of academic biology, substantive taxonomy long ago settled to the bottom. This must not be permitted to continue." (*Ecology*, 1971, 52(5):741)

There are two critical points to be drawn from such lamentations. The first is that Big Science prevails in models of funding and education based on STEM (acronym for Science, Technology, Engineering, and Mathematics). STEM is an ideological construct that ensures the relegation of life sciences, earth sciences, and social sciences (and the humanities!) to secondary or even marginal importance. STEM is the ultimate incarnation of the structure of scientific knowledge consolidated since WWII derived from Vannevar Bush's *Science: The Endless Frontier* (1945) that led to the creation of the National Science Foundation. STEM is fundamentally grounded in militarism, making science the pawn of government and the pursuit of war-making the top priority. To accept this realization is suddenly to find our innocent studies of Amanita and Entoloma thrust into the arena of political struggle that is always uncomfortable and usually repellent. State-controlled science lacks a moral center, and the juggernaut of military megatechnics coupled to the willful irrationality of climate change denial proves this on a daily basis.

Second, mycology tends to forfeit its own history. This is ironic, since mycology is inherently historical. After all, why do we return to Fries, Persoon, and our mycological forebears to validate or reform taxonomic and nomenclatural determinations? While mycologists are busy with original discoveries of significance, historians of science have been busy neglecting it all. We need to find ways to understand and promote our own history that are relevant, cogent, and designed to educate about the contradictions of the profession, along with its vital contributions. This may seem small beer compared to jousting with Big Science. Goethe once intimated that a primary goal of science is the transformation of the scientist, and until we extend and amplify personal transformation, we will continue to face the kinds of epistemological crises that Mr. Newman so deftly describes. Kudos to him for his enlightening "rant," which is not so much a rant as the basis of a critique of the social and institutional context of science.

David Rose
Connecticut-Westchester Mycological Association (COMA) / July 22, 2019

Book Review: *The Allure of Fungi*

Alison Pouliot (https://alisonpouliot.com/)

2018; CSIRO Publishing (www.publish.csiro.au/book/7790)

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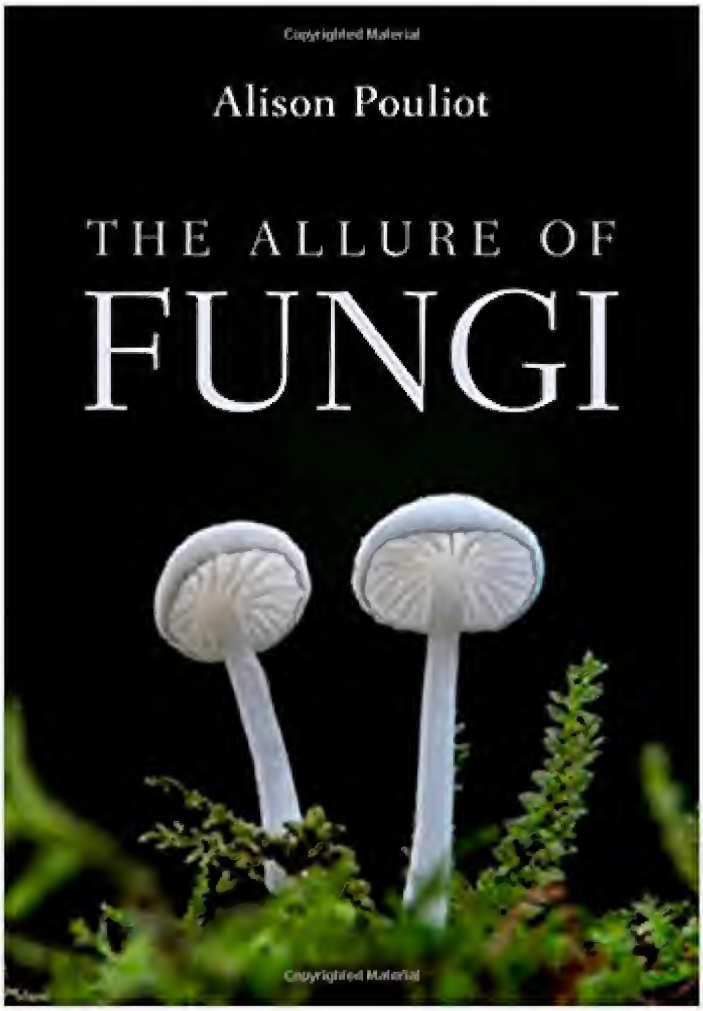


To be honest, my initial impression when I opened *The Allure of Fungi* was not favorable. As I often do, I looked first at the photographs and was disappointed by many of them (more about that below). Fortunately, I withheld judgment and, once I got into the text, found that it is quite a fine book and deserves a wide readership.

Dr. Alison Pouliot is a hemisphere-hopping Australian ecologist and photographer, with a keen interest in fungi, their activities, their relationships with people, and their conservation. Desiring to have fungi available to her year-round, she spends half her year in Australia and the other half in Europe to experience two peak fall seasons (at the expense of spring morel hunts, I wonder?). As a brief trip to her website will attest, she maintains a full schedule of activities, mostly aimed at drawing the general public's attention to the importance of fungi. For example, in the two decades before writing the book, she led over 300 fungus forays, workshops, and seminars in Australia and Europe, attended by over 5000 people.

From the back cover: "*The Allure of Fungi* presents fungi through multiple perspectives — those of mycologists and ecologists, foragers and forayers, naturalists and farmers, aesthetes and artists, philosophers and Traditional Owners ("traditional owner" is an Australian term for a descendant of the tribe or ethnic group that occupied a particular region before European settlement). It explores how a history of entrenched fears and misconceptions about fungi has led to their near absence in Australian (not just there!) ecological consciousness and biodiversity conservation."

The Prologue provides a synopsis of the reasons for, and background of, the book. "Between 2012 and 2016, I spent 1000 days in the forest to search for the answer to one question — why are fungi regarded so differently from other forms of life? … The answer to this question provides the possibility for fungi to be recognized as vital to functioning ecosystems and to be included in biodiversity conservation. However, it also offers something else — the opportunity to think differently not just about fungi, but the natural world more broadly … My 1000 days in the forest were spent with both fungi and the people who are drawn to them. The choice to conduct the research directly in the forest stems from my view that fungi, indeed all organisms, can only properly be understood through direct sensorial experience of them … This is an account of human-fungus relationships and how fungi are perceived and understood … While it has an

Australian focus, it has been enriched by ideas gleaned across hemispheres and cultures."

The book is well written and avoids jargon (although a few of the terms, such as "ute" [a utility vehicle, sort of a hybrid between a sedan and small pickup truck], might be unfamiliar to non-Aussies). It comprises nine chapters, with photo essays (typically comprising 9 or 11 full-page images) following each of the first eight: 1—An introduction to entangled worlds (Photo essay: The mycelial matrix); 2—Meeting mushrooms (Endless forms most bizarre); 3—Life in the subterrain (Fungal grub and fungal havens); 4—A stubbly burn skirmish (Biological umbrellas); 5—Wicked wild mushrooms – a morality tale (Recycling worlds); 6—Organising fungi (Undersides); 7—Knowing fungi otherwise (Collecting); 8—Foraging and foraying (Lichenised lives); 9—A call for fungal wisdom. A great deal of ground is covered — the importance of fungi as mycelial organisms that participate in many symbioses and often cloud the idea of what an "individual" is; the contrast between foragers (those who seek fungi for food) and forayers (those who seek fungi for science or other reasons besides food); the diversity of forms among mushrooms; where do fungi live and how does their usually underground habit influence the way we view them; why is "mushrooming" a verb of condescension; how have mushrooms been identified and categorized and how have these activities been perceived by non-scientists; and much more.

And now, about those photo essays. Clearly, Pouliot is an accomplished photographer and many of the images in the book and on her website are beautiful. But a large proportion are in a style that is not my cup of tea — close-ups in which nearly everything is "softened" (i.e., out of focus), with just a very shallow bit of the image sharp. I feel that, when trying to convey a sense of the natural world, especially to folks who might have only limited experience with it, it is better to let the inherent beauty make the impression, free from obvious human manipulation. Think the photography of Taylor Lockwood. But, as they say, variety is the spice of life, and no doubt there will be many who love the photos. Regardless of which camp you are in, the book is well worth reading for the text alone.

The science presented is sound overall, and the occasional misstatements are far fewer than I ordinarily find in the books I review — earthstars and puffballs, although similar in appearance, are not very closely related — the former are part of the *Ramaria-Gomphus*-stinkhorn group, whereas the latter are close kin with *Agaricus* and *Lepiota* s.l.; the explanations of "synonymy" and "homonymy" are reversed; and no way swallowing the tiny bit of mushroom, even a death cap, used for an identification "taste test" could be lethal (although I certainly don't recommend people swallow even tiny bits of death caps).

Nearly 30 years ago, in an article titled "The Ties that Bind: Fungi in Ecosystems," Jim Trappe and Dan Luoma stated "An understanding of the initiation, development, structure, and processes of ecosystems cannot approach reality if major participants are neglected. Such neglect has been the norm rather than the exception in regard to fungi …" Unfortunately, the same observation could be made today. Trappe and Luoma conclude with "Fungi profoundly affect nearly all ecological processes and events; to ignore or overlook the truth is to fail in the quest for a clearer understanding of ecosystems." Hopefully, through the efforts of people like Pouliot, the message that mushrooms matter will start gaining wider appreciation. I heartily recommend *The Allure of Fungi*.

Steve Trudell

Note: Those who reside in the Pacific Northwest will have a chance to hear Dr. Pouliot speak. She will be visiting this October and delivering a series of presentations to mushroom clubs and other audiences, sponsored by the Daniel E. Stuntz Memorial Foundation and Stuntz Mycology Fund. Consult her website, or those of the Puget Sound Mycological Society, Snohomish County Mycological Society, Northwest Mushroomers Association, and South Sound Mushroom Club, for locations and schedule.

2019 NAMA Foray Report

By Karen Monger, first time attendee

As first time attendees of a NAMA foray, my husband Robert, daughter Gillian, and I looked forward to a weekend filled with fungi. Our drive from southeastern Connecticut brought us into the Adirondacks in a spectacular manner, as we passed through dense forests filled with clear streams and green mountain tops in the distance. The small size of Paul Smith's College was compact and ideal for the foray; it allowed housing, meals, classes, evening programs, socials, and the foray collection to take place within a reasonable area connected by pathways and short walks.

Our Thursday at the foray was filled with meeting new faces and greeting old friends as we headed to the cafeteria for dinner. Afterwards we gathered in the Freer Auditorium for a short informational session about correctly collecting and vouchering specimens for the Mycoflora project (dig, don't pick!), and Dr. Rick Van de Poll's presentation about local forest ecology and which fungi we can expect to collect. Our

evening ended early after a quick stop at the evening social for a light snack.

After breakfast on Friday, we hopped in one of the vans and headed out to PSC Visitor Interpretive Center to foray along the Barnum Brook and on the Boreal Life Trail. The mixed hardwood and conifer forest held a wonderful array of mosses

and lichens, along with Amanitas, Russulas, and saprobes on downed wood. The black spruce and tamarack-filled bog offered opportunities to spy some carnivorous pitcher plants and sundews, wild cranberries and blueberries to snack on, and some Suillus. Upon returning to campus, we unloaded our fungal finds from the baskets and attempted some identifications before heading to lunch.

Friday afternoon was dedicated to some classes including John Plischke's Photography Workshop, "Ganoderma of the United States" with Matt Schink, and a culinary workshop given by the chair of the Culinary Arts Committee, Salma St. John. Friday evening programs included "Mentoring in Mycology-A Bolete Story" with

Roy Halling which illustrated his educational journey in mycology and shared the mentors that shaped his career. It was followed by a program given by a high-school student, Olga Khmelnitsky, who shared her journey about mentoring with Roy and his colleagues at the New York Botanical Garden titled "Making it in Mycology: The High School Researcher Experience". The evening wrapped up with another visit to the social.

Saturday was another day spent taking classes, including "The Little Fungi in our Lives" with Dr. Kathie Hodge, and "Appalachian Macrofungi: Some common and Uncommon Fungi Found in the Appalachian" with field mycologist Walt Sturgeon. My husband spent most of the afternoon in the collection area up at the Buxton Gym, photographing specimens and using the microscopes to view spores. Robert also attended many of the table talks where the foray mycologists give informal talks to an assembled group about a particular genus or group of fungi on the display tables. Late afternoon was the time for a myco-snack with the Mycophagy session headed by Ursula Pohl offering tastes of several different mushrooms, my favorites being the chanterelle soup and the pickled maitake.

Our evening programs for Saturday included several awards given by NAMA President, Barbara Ching. The winners of the NAMA 2019 photo contest were also shown, and the photos represented some of the beauty of our fungal world (with the addition of a turtle, a frog, and a moth in a few photos). The final program was given by Gavin McIntyre, one of the co-founders of Ecovative, a company that specializes in using fungal mycelium to grow alternative meat products (Atlast™), biodegradable packaging materials (Mycocomposit™), and animal-free leather substitutes (Mycoflex™). Gavin's program illustrated some of Ecovative's products and he talked about the company's philosophies to help reduce plastic waste and animal agriculture which they consider "the single biggest contributor to global warming and the biggest user of arable land planet-wide. In both of these markets, consumers and brands are demanding shifts to cleaner production". Gavin's program resulted in many questions from the attendees, and he continued answering questions at the final evening social. We hope to attend another NAMA foray in our future!

More About Mycorrhizae

By David Rust

(Editor's note – This is the second part in a series about Mycorrizae. Find part one in the July-August issue of the Mycophile, page 14.)

Mycorrhizal symbiosis is a seemingly simple concept: plants provide carbohydrates; fungi gather nutrients. That's once the mycorrhizal connection is made, but what's involved in the process of colonization? How do these underground connections come about at the structural level of hyphae and the root system? What environmental factors are in play to facilitate this connection?

How do fungi and plants make a mycorrhizal connection?

The initial formation of fungus-plant root connection resembles diplomacy. Nutrients that plants have taken in and used for photosynthesis (or building tissue) get transformed into new organic compounds which may be toxic or no longer needed. At the cellular level, organic molecules and catalyst nutrients are moved in and out of the cell to prevent a buildup of toxins. Plants dump photosynthetic waste compounds and the byproducts of respiration through their root system into the soil (rhizosphere). These organic compounds change soil pH and overall soil biology, and their presence can signal that the plant is seeking a fungal partner. Prior to initiating an interaction, a plant may respond to fungal signals and accept or reject potential partners based on their identities or anticipated benefits (Bogar, 2019). Given that a particular vascular plant or tree may have multiple species of fungi associated with its root system, colonization and re-colonization by fungi is constant as new roots emerge. The concept of plants as "hosts" in mycorrhizal relationships is often overstated, but they definitely have a say in which fungi they will accept as partners.

Chemical signaling may attract the attention of nearby hyphae; it may also induce germination of a spore in the soil bank. Colonization can take place by either a nearby spore or from the approach of compatible hyphae in the rhizosphere (Smith and Read, 2008).

In return, fungal signals drive physiological changes in the potential root partner. As the hypha approaches a root, the root epidermis thickens in anticipation of fungus-root contact. The hypha accumulates acidic polypeptides (enzymes), creates an entry point into the

epidermis, and then drills through this outer wall and penetrates between the cortical cells. A flat disk called an "appressorium" is formed, which firmly attaches the hypha to the plant cell wall. Through continued gene expression of symbiosis-related polypeptides, the process of nutrient exchange begins (Smith and Read, 2008). During this initial period, the plant produces stress and defense related proteins, indicating resistance to colonization. This threat response subsides over a period of 14-21 days, and may have originated as a natural defense against pathogens.

Colonized roots are stimulated to produce side branching, which is why mycorrhizae look so gangly.

Another Important Discovery: Mycorrhization Role of Soil Bacteria

Research has identified another piece to the puzzle of fungus-plant root colonization: the influence and actions of nearby soil bacteria, a concept known as Mycorrhization Helper Bacteria (Duponnois and Garbaye, 1991).

The wide range of lineages of Mycorrhization Helper Bacteria identified so far belong to many groups and bacterial genera, such as Gram-negative Proteobacteria (*Agrobacterium*, *Azospirillum*, *Azotobacter*, *Burkholderia*, *Bradyrhizobium*, *Enterobacter*, *Pseudomonas*, *Klebsiella* and *Rhizobium*), Gram-positive Firmicutes (*Bacillus*, *Brevibacillus*, and *Paenibacillus*) and Gram-positive actinomycetes (*Rhodococcus*, *Streptomyces*, and *Arthrobacter*) (Rigamonte, 2010).

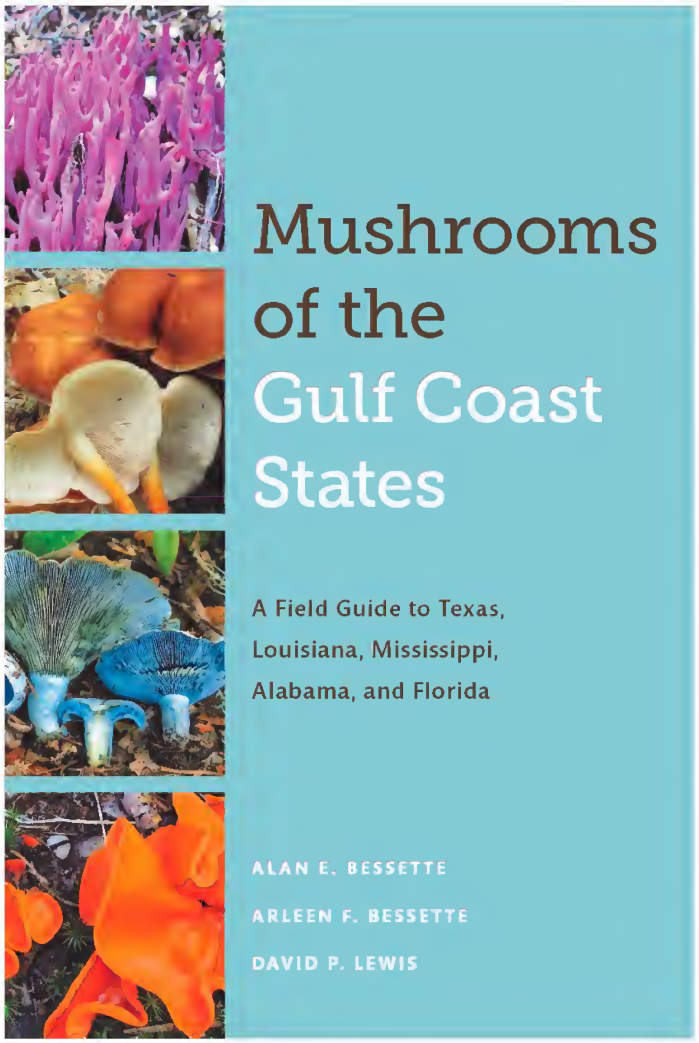
These bacteria have created a niche whereby they are key to the process of mycorrhizal colonization. Mycorrhization Helper Bacteria influence receptivity of the root to the fungus, engaging both partners to assist root-fungus recognition; influence and stimulate fungal growth; promote stabilization of rhizospheric soil; and stimulate the germination of fungal propagules. Release of organic material by the root system of the plant is a natural source of nutrients which get recycled by mycorrhizae. These root exudates serve as substrates for soil bacteria. The relative soil pH also determines the composition of genera of bacteria which can live in this environment. It just so happens that many of these genera of bacteria are also Mycorrhizal Helper Bacteria. As noted above, plant roots clearly influence the microorganisms in their rhizosphere. Bacteria which thrive in this organic "soup" help the plant ward off pathogens, and adapt to stress conditions concerning water and mineral nutrition (Lynch, 1990).

Some of these same bacteria may act as rhizobia, fixing nitrogen and sourcing additional nitrogen and phosphorus for the plant root system.

Next issue: Look for an explanation of how the mycorrhizal connection works to provide nutrients for plants, and some of the tricks fungi (and bacteria) employ to acquire them.

Book Review: *Mushrooms of the Gulf Coast States — A Field Guide to Texas, Louisiana, Mississippi, Alabama and Florida*

Alan E. Bessette, Arleen R. Bessette,
David P. Lewis
University of Texas Press. 2019.
Paperback, 576 pages.
ISBN 978-1-4773-1815-7



"Mushrooms of the Gulf Coast States," a beautifully bound and imperviously jacketed gem of a field guide by veteran myco-authors Alan and Arleen Bessette and myco-colleague David Lewis, in his first book, fills a huge gap in our understanding of the mycota of this diverse and interesting region. The book covers a wide variety of fungal habitats, and is focused primarily on the states of Texas, Louisiana, Mississippi, Alabama and Florida, with some overlap to the Atlantic Coast Plain and North Central and Northeast Mexico.

This guide contains descriptions of more than a thousand fungal species, both commonplace and rare, 667 photos, including large format species illustrations, and lots of helpful identifying details, both macro and micro. Remarks accompanying descriptions include potential lookalikes and interesting or unusual features. Both edibility and toxicity are briefly discussed, when known, and are subject to the usual author biases.

After introductory chapters on general mycology, collecting practices and methods of identifying fungi, the authors go right to the meat of the matter: species descriptions and photographs. In addition to the authors' own photos, many fine Southeastern photographers also contributed to this work. A number of species were illustrated for the first time in any field guide.

The Bessettes brought their breadth of knowledge to play in extensive sections on *Lactarius* and allies and the many new genera found in the Boletales: from *Alessioporus* to *Xerocomus*. A particularly interesting *Xerocomus* sp., provisionally named *X. sclerotiorum* by the Bessettes, is an edible bolete that forms sclerotia!

David Lewis has extensive mycological field experience in the Gulf Coast states, in part showcased within this book by many unique and beautiful examples of *Amanita*, as well as *Cantharellus*. Check out his photo of the amazing *Amanita westii*, with its chocolate brown gills! This species was first found in Florida in 1945, and only recently rediscovered in Eastern Texas.

Extensive research and DNA sampling has resulted in an expansion of our understanding of North American chanterelles. Several unique

chanterelle species of the Gulf Coast region are published here in a field guide for the very first time, including David's namesake chanterelle, *Cantharellus lewisii*!

Various keys are provided to help readers put names to mushroom finds. A simple pictorial key, which is grouped into easy macro-morph categories like polypores, gilled mushrooms, crusts, boletes, chanterelles, cup fungi and the like, prefaces the species descriptions. Large species diverse groups like gilled mushrooms and boletes and polypores have their own dichotomous keys. The Gilled Mushroom key starts with spore color questions; yes, Virginia, spore prints are still important, especially for those first starting out in their mushroom identifications.

Within these larger groupings, species are listed alphabetically. This may be a mite confusing to those who have missed the many new genera proposed for species formerly lumped in the genus *Lactarius* and *Boletus*, but progress is both inevitable and sometimes even painful, at least to those who must now forget an old name and remember a new one! Sequencing has served to help tease out cryptic species and correct outright generic misplacements in many groups of fungi. It's a brave new fungal world.

A handful of species in this book were designated as range restricted. It was unclear to me if most species occurred across all of the Gulf Coast states. I would have appreciated a listing of states in which each species had been found. Habitats were listed for all, so perhaps the authors wanted us to keep an eye out for these species whenever in appropriate habitat, regardless of states where it might already be known to occur?

The one flaw that I found in this book amongst many other praiseworthy elements was the inappropriate use of three unpublished *Amanita* names: *amerimuscaria*, *amerifulva* and *amerivirosa*. Although we are well aware that the European forms of *muscaria*, *fulva* and *virosa* do not occur in North America, at the very least the delimiting term "nom. prov." should have been appended to those provisional names.

Although this field guide is neither lightweight in heft nor scope, next time I fly to the Gulf Coast, I will be making room in my already overstuffed luggage for this 3+ pound volume. Residents and visitors alike should rejoice in this beautifully researched, attractively produced and long overdue fungal field guide to a fascinating and formerly under-served region of our country.

Review by Debbie Viess

Book Reviews for the *Mycophile*

One of NAMA's committees that remains little known to probably the bulk of the membership is the Editorial and Literature Committee, the literature function of which is coordinated by Steve Trudell. The committee has several charges in the NAMA Policy Manual but an important one is to provide reviews of books, DVD's, apps, software programs, and the like for publication in The Mycophile. If you learn of a new book (or DVD or whatever) that you feel would be of interest to other NAMA members, or if you would like to write a review, please contact Steve (mycecol@uw.edu) so that he can coordinate acquisition of the items and submission of reviews to the newsletter.

Mushrooms Changed My Life

By Alexander (Sasha) Viazmensky
St. Petersburg, Russia

Sharing his passion for forests, his beloved mushrooms, and painting leads to a life fully lived.

This is the third Mycophile article in a series on "Mushrooms Art" prepared by NAMA Secretary Howard Goltz.

Given Russia's historic and current passion for "wild" mushrooms, it's no surprise that one of the world's most highly recognized and appreciated mushroom artists is from Russia. Alexander "Sasha" Viazmensky brings mushrooms to life in his classic, yet contemporary, botanical style watercolor paintings, combining art and science to record accurate information about the shapes, structures, colors, life cycle and habits of fungi in a pleasing image.

I first met Sasha in 2010 at a watercolor workshop he held at the Minnesota School of Botanical Art, followed by a presentation of his work at a Minnesota Mycological Society member meeting. We met again to foray around Mt. Ranier at NAMA's Patrice Benson 2014 Foray, where I created my first "mushroom" watercolor painting under his tutelage in his "NAMA" class.

Born in Leningrad in 1946, Sasha is an electrical engineer, graphic artist, jeweler, and watercolor artist. His mushroom watercolors having been exhibited, collected, and published across the U.S. and worldwide. He will be teaching his next U.S. mushroom watercolor painting classes this November at the Minnesota School of Botanical Art and at the Morton Arboretum near Naperville, IL. He calls his watercolors "Portraits of Mushrooms." Just as human portraits reflect one's personal surroundings, his mushroom portraits are composed with a scattering of elements from their natural environments. In addition to private collections, his work is included in the collections of the Hunt Institute in Pittsburgh, the Minneapolis Institute of Arts, the Shirley Sherwood Collection and the Komarov Botanical Institute in St. Petersburg.

His work is shown, and for sale, on his website:

http://www.alexandermushrooms.com/

"Forty years ago I came back from the woods with my usual basket of mushrooms. They had been especially beautiful that day. I realized then that the minute I cut them, their beauty would disappear forever. I decided to save that beauty somehow, so I sat down at my desk and started painting them. I did not know then that is was my first step on the trail of botanical art. Until then, I had only been painting landscapes to sell, making a modest living.

I first came to Minnesota in 1989 to visit my long-time Russian friend, Michael Peltsman, who emigrated to the U.S. years ago. He knew that I was in love with mushrooms, so he contacted the Minnesota Mycological Society and took me to a member meeting to show my mushroom paintings. One of the members, Lee Muggly, surprisingly invited me to his summer cabin to hunt mushrooms. I had almost no English at that time. It's funny to remember how Lee and I communicated at the beginning. We spent our days in the woods around Outing, MN, and then every night Lee brought me to the local bar, where after a big mug of beer I was "talking" with local people. In two weeks I knew English much better! It's so sad that Lee is no longer with us. I miss him a lot.

Over the coming years I became acquainted with NAMA societies in other states and started participating in their forays and shows. It was such a wonderful surprise for me that I I could find and paint fresh, wild mushrooms in the U.S. throughout most of the year by going from

state to state. The mushroom season around St. Petersburg typically ends by the middle of October.

After that I returned several times to the U.S. to continue these happy times. In 1992 I participated in the American Society of Botanical Artists' annual art exhibition at the Hunt Institute in Pittsburg and realized that my mushroom paintings were indeed, "botanical art." In 2013, my story and mushroom watercolors were the feature article in ASBA's national journal "the Botanical Artist."

In one of my next U.S. visits I luckily met Marilyn Garber, who invited me to do a workshop in painting mushrooms at her Minnesota School of Botanical Art. I had never done this before, but I had a feeling that I had enough experience and skill to share my methods with others. I tried, and I enjoyed it very much.

Since then, I have conducted many workshops in the U.S., including at NAMA's 2014 Patrice Benson Foray near Mount Ranier, WA. I've been introducing mushrooms to botanical artists and introducing botanical art to mushroom lovers ever since.

Puget Sound Mycological Society 2016 Class

In 2012 I started teaching botanical art classes in St. Petersburg - the first botanical art classes in contemporary Russia. We now have a strong group of botanical artists in St. Petersburg and Moscow, and we organize regular exhibitions in both cities and participate in international shows.

St. Petersburg Exhibition, 2018

Throughout my life I have been in love with mushrooms. I have, of course, always enjoyed eating them, but that was nothing compared to my happy feelings of just seeing them in the woods. Perhaps my love was so big that they decided to pay me back, changing my life and making it happy."

Selected Works: "I call my watercolors "Portraits of Mushrooms." For these portraits, I select not the most typical, but the most pleasant and happy looking individuals. And I paint them life size. I hope you can recognize in my paintings not only the species of the mushroom but the variety as well. Yet much more important for me is to show the unique beauty and personality of each mushroom."

Amanita muscaria II

Amanita muscaria

Forest Bouquet II, Russian Choice

Tricholoma flavovirens

Boletus radicans

Boletus edulis II

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Fungus of the Issue: *Tolypocladium inflatum*

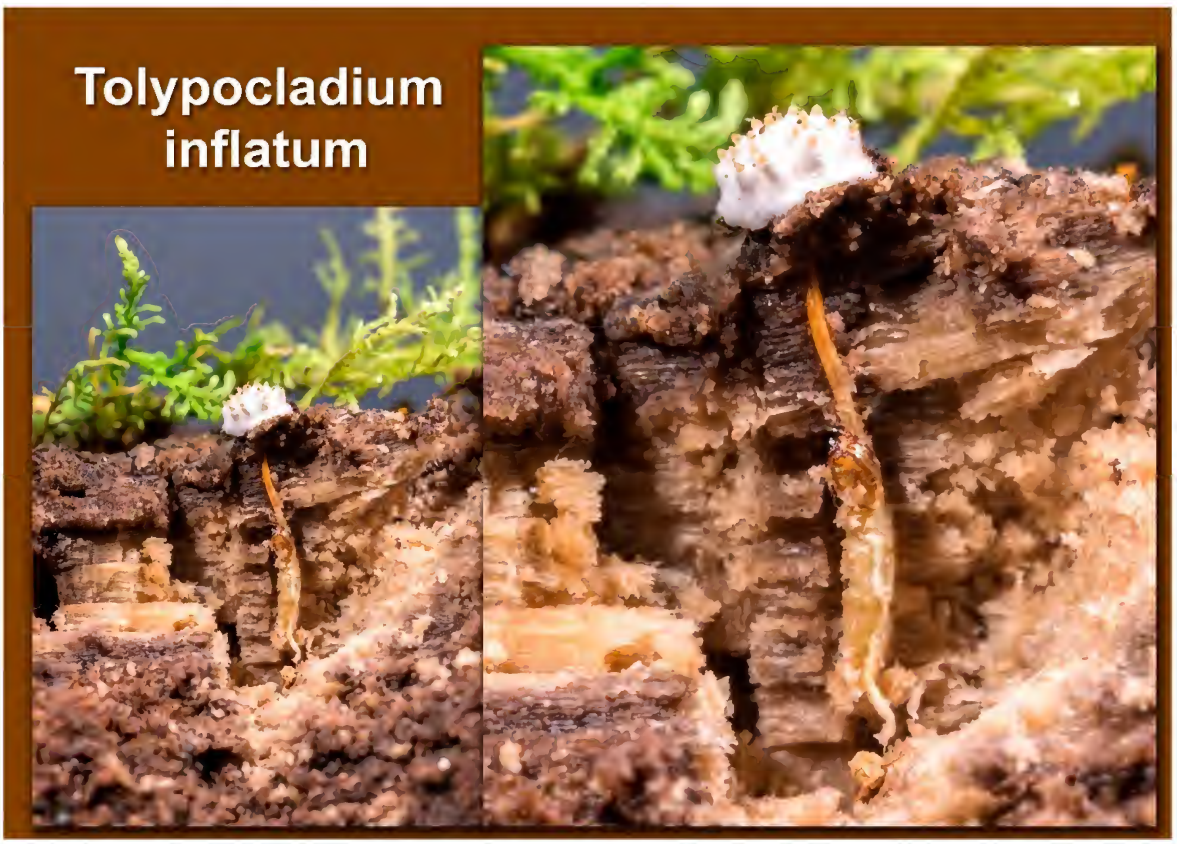


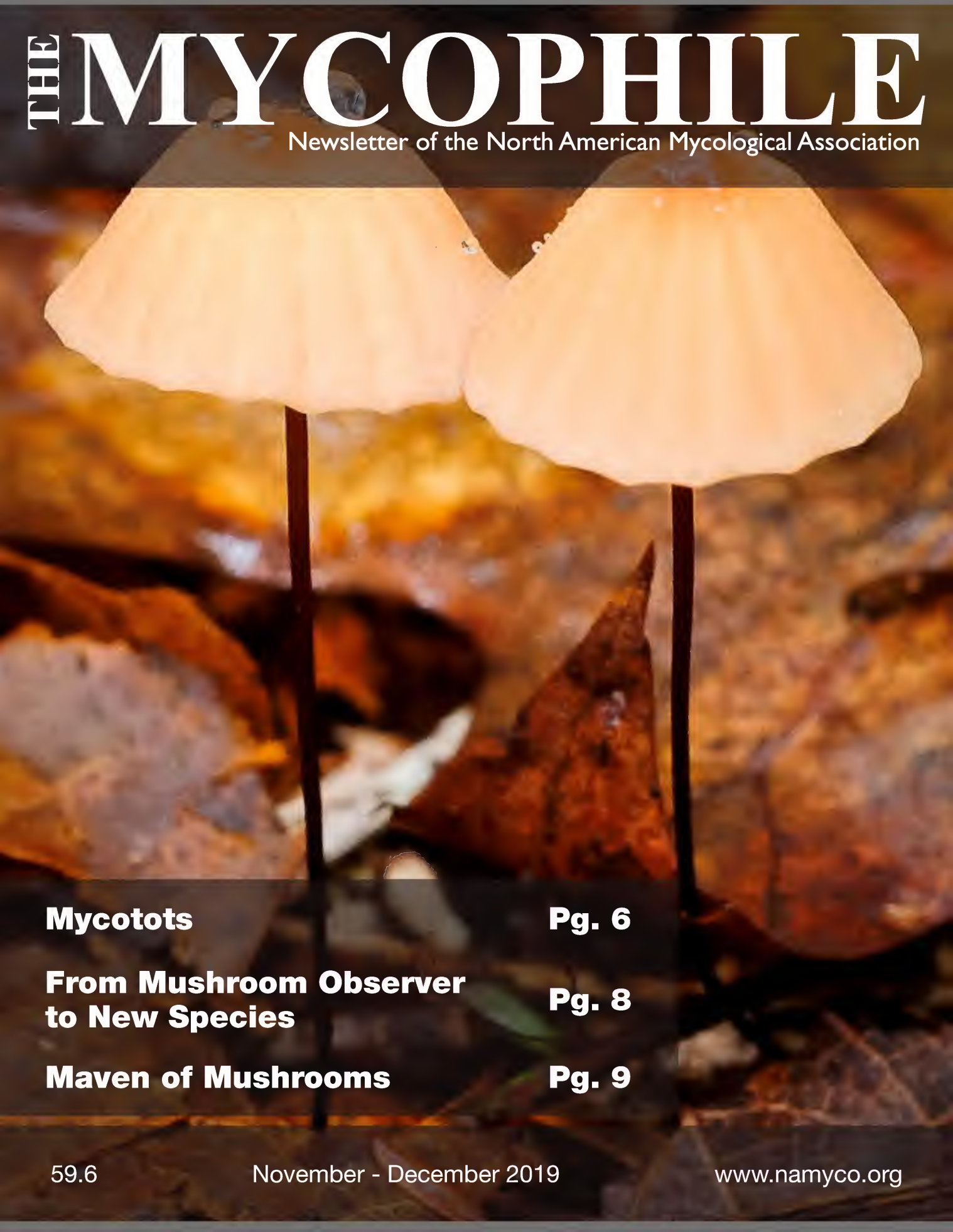
Photo by Robert Gergulics

Previously known as *Cordyceps subsessilis*, ***Tolypocladium inflatum*** is an ascomycete fungus that, under certain conditions, produces the immunosuppressant drug ciclosporin. In its sexual stage (teleomorph) it is a parasite on scarab beetles. It forms a small, compound ascocarp that arises from the cadaver of its host beetle. In its asexual stage (anamorph) it is a white mold that grows on soil. It is much more commonly found in its asexual stage and this is the stage that was originally given the name *Tolypocladium inflatum*. source: Wikipedia

Edited by: Karen Monger and Barbara Ching • Printed by Old Town Printing, Inc.

THE MYCOPHILE

Newsletter of the North American Mycological Association



Mycotots Pg. 6

From Mushroom Observer to New Species Pg. 8

Maven of Mushrooms Pg. 9

59.6 November - December 2019 www.namyco.org

Santa Cruz Mycoflora Foray

Registration opens on September 1st for the 4th Annual Santa Cruz Mycoflora Foray, to be held December 12 – 15, 2019 in Scotts Valley, CA. Registration links and information about dates, programs and accommodations can be found at http://scmfforay.com/

It will be a fun and educational three days in the beautiful Santa Cruz mountains for novices and experts alike. Meals and lodging are included in the price for this long weekend of great workshops, presentations, and special permitted forays in areas otherwise off-limits to foraging. There will be mingling with an interesting and fun group of professional & amateur mycologists, mycophiles, and novices, while learning more about the fascinating world of fungi which will greatly enhance the experience. Our collections will contribute to two exciting multi-year citizen scientist Mycoflora projects, documenting all species of mushrooms growing in Santa Cruz County and ultimately the entire US, which will be publicly accessible via iNaturalist. Herbarium samples and DNA analysis of every species documented will also be stored and accessible for use by future researchers.

Cover Photo NAMA Photo Contest 2019 Limited Pictorial 3rd Place Marasmius siccus by Kelly Sinclair

A Field Guide to Mushrooms of the Carolinas

This tome is the first ever field guide to mushrooms and other fungi that can be found in the diverse habitats of North and South Carolina. It covers several distinct ecological regions including the Blue Ridge Mountains, Piedmont, the Southeastern Plain, the Middle and the South Atlantic Coastal plains, as well as fungi that can be found in cities, towns and farmsteads. The introduction is well-written and while it covers all the important points that beginning mushroomers need to know, the content will appeal to the experienced forager as well with its mix of facts and original humor. In addition to describing the various regions, the authors provide advice on mushrooming gear, eating mushrooms and on naming them. The following section addresses mushroom identification, describing the parts, the types of fertile surfaces; spores; and calls attention to various features of fungi which the forager should carefully observe in efforts to identify mushrooms. These include its general appearance, color, surface features, characteristics of the flesh and stem, odors and tasters; chemical reactions, microscopic information as well as noting its ecology and habitat. There is a brief description of the book's identification keys and the format of included species descriptions. The passage on frustration is a welcome addition to the introduction:

> "No amount of blood, sweat, tears, digging, or cursing may be enough to secure a solid ID. Perhaps you will get as far as genus: sometimes not. Don't take it personally. The next time you encounter that species, the specimen in hand could be younger or older. Maybe experience will have taught you a little more. It's a wonder how many mysteries evaporate with repeated exposure."

The overall format divides the fungi included into different sections: gilled mushrooms; chanterelles and lookalikes; boletes; polypores; crusts, parchments and fiber fans; fungi with teeth; clustered corals and cauliflowers; jelly fungi; stinkhorns; puffballs, earthballs, earthstars, bird's nest fungi and the sphere thrower; cup fungi; earth tongues and clubs; carbon and cushion fungi; cordyceps and similar lookalikes; hypomyces; some common plant pathogens; and underground fungi, including truffles. Each of these sections first describes the general characteristics of the fungi treated, provides notes on spore colors, odors, important observable field characteristics and an easy to follow identification key for locating pages on specific genera or species within the various groups and subgroups. According to the publicity materials, the book includes photos and descriptions of 650 fungi common to the Carolinas, and of these 50 are said to be new to field guides.

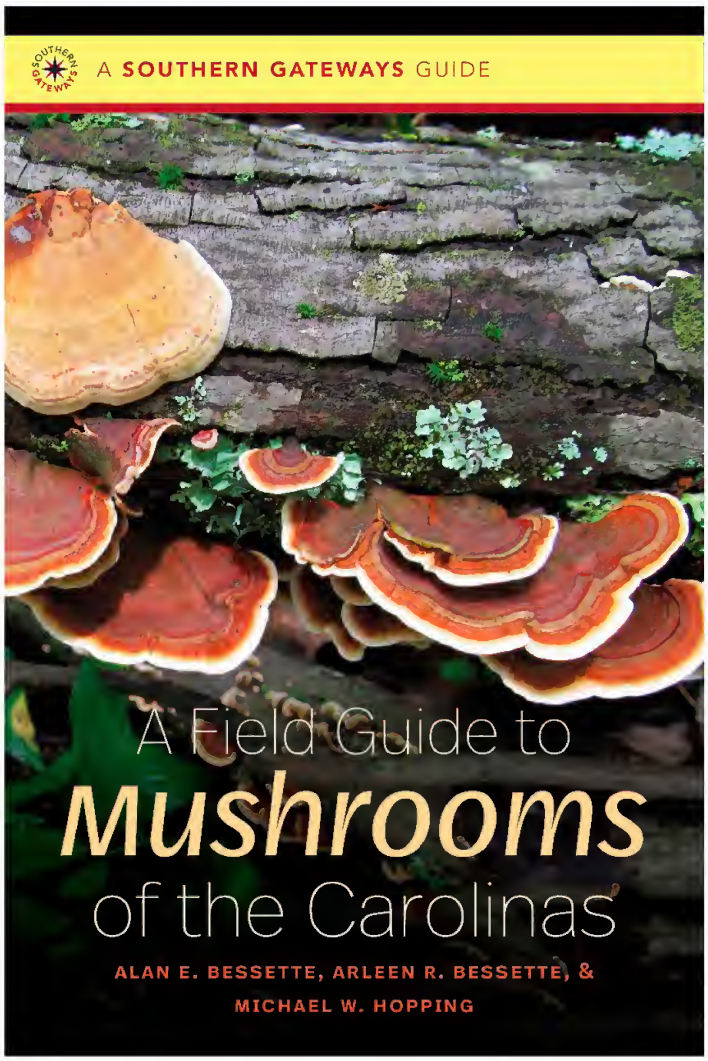
There are two specimens featured and described on the majority of pages. The photos are sufficiently large to show the fruiting body growing in its habitat along with others displaying the hymenium, and any particular characteristics such as latex or staining patterns. The information on each fungus includes the scientific name and associated authors, the common name if there is one, a precise description, spore print color, occurrence (habitat, time of fruiting), edibility status, microscopic and chemical features, and a comment section. The latter introduces the meaning of the species name, synonyms, and notes on the main differences between the described fungus and lookalikes. Where a lookalike is not featured in the field guide, readers are directed to search for it online. Following the field guide description and photos is a short history of mycology in the Carolinas. The contributions of several notable mycologists to the understanding of the fungi of the Carolinas are discussed such as Lewis D. de Schweinitz, Moses Asley Curtis, Henry William Ravel, , George Francis Atkinson, Henry Curtis Bearslee, William Chambers Coker and Robert Whittaker. The authors credit twenty-first century Citizen Scientists for their role in further delimiting the genetic diversity of fungi using the DNA approaches to classification initiated by Rytas Vilgalys, a student of Orson Miller at Virginia Tech. In addition there is an extensive glossary of mycological terms, Literature references and websites and another on photo credits. This is followed by an index of common names, and an index to scientific names.

A Field Guide to Mushrooms of the Carolinas offers amateur beginners and experienced mushroomers a useful guide to mushrooms unique to the diverse habitats of the southeast. Since many of the fungi can also be found in other regions, those of us living outside of the Carolinas to the east of the Rockies will find this book a worthy addition to their library. I recommend it without hesitation.

Dianna Smith

Book Review: *A Field Guide to Mushrooms of the Carolinas*

Alan E. Bessette, Arleen R. Bessette, and Michael W. Hopping 2018; The University of North Carolina Press (www.uncpress.org) ISBN 978-1-4696-3853-9 (Paperback: 9 × 6", 432 pp) $30.00



And the eastern mushroom guides keep on coming, especially those from the Southeast. Recent releases have included *Southeastern Mushrooms*, by Todd Elliott and Steve Stephenson, Tim Baroni's *Mushrooms of the Northeastern United States and Eastern Canada*, *Mushrooms of the Georgia Piedmont & Southern Appalachians: A Reference* by Mary Woehrel and William Light, and, most recently, *Appalachian Mushrooms: A Field Guide* by Walt Sturgeon. They have joined Bill Roody's *Mushrooms of West Virginia and the Central Appalachians*, *A Field Guide to Southern Mushrooms* by Nancy Smith Weber and Alexander Smith, and *Mushrooms of the Southeastern United States* by the Bessettes, Roody, and Dail Dunaway. So, is there really a need for another one? Let's see.

The organization of the book is typical for a field guide. Up front are *Introduction* (*Regions and Habitats*, *Getting Oriented*, *Mushrooming Gear*, *What's in a Name? Can You Eat It?*), *Mushroom Identification* (*Parts of a Mushroom*, *Fertile Surface*, *Spores*, *The Support Structure*, *Chemical Reactions*, *Microscopic Information*, *Habitat and Ecology*), *How to Use this Book* (*Identification Keys*, *Frustration*, *Species Description Format*), and *Color Key to the Major Groups of Fungi*.

Pretty much the standard stuff, but with occasional bits of misinformation. For instance, it is not true that Melzer's reagent is a "federally controlled chemical unavailable to laypeople." While it is true that it contains a controlled substance (chloral hydrate), Melzer's itself is not a listed substance. And, although it is not always easy to obtain, it can be had by anyone with a little effort. If you are fortunate enough to live near a university with a resident mycologist, often (s)he will be willing to share the small amount one needs. If you aren't so lucky, it is readily available in Europe and can be mail-ordered from some (although not all) vendors there, or, in the USA, a licensed physician can write a prescription to be filled by a compounding pharmacy (see Leonard 2019. Melzer's reagent update, 2019. *FUNGI* 12[2]: 10). There is no evidence to support the notion that using a mesh bag to carry your collected morels has any effect on their populations — they are quite capable of dispersing their spores without our help. The "humongous fungus" in northeastern Oregon is not a single mycelium. The toxicity of raw/undercooked morels is not due to monomethyl hydrazine-type toxins like those of gyromitras, but rather to other, as yet uncharacterized, compounds. Not all crust fungi are decomposers, many are ectomycorrhizal.

The bulk of the text comprises the *Species Descriptions and Illustrations*, and the book concludes with *A Thumbnail History of Carolina Mycology* (interesting enough that I would have put it in the front of the book), *Glossary* (which inexplicably includes a lot of common English words such as angular, bald, central, concentric, and maroon, and do we really have to be told that musky means "having a strong odor of musk"?), *References and Resources*, *Photo and Picture Credits*, *Index to Common Names*, and *Index to Scientific Names*.

The 600 species descriptions are presented two per page following brief descriptions of genera or other groupings. Each includes a photo at the top of the column. The scientific name with author is given in a small font, often with a common name beneath it in a larger bold font. Many of the common names are fairly standard ones, but others, such as "plate full of pyramids lepidella"

Craterellus fallax A. H. Sm.
BLACK TRUMPET
Description: Cap 1–8 cm wide, deeply funnel-shaped. Margin inrolled at first, becoming uplifted and wavy or lobed. Upper surface minutely scaly or fibrous, grayish- to dark brown or blackish. Lower surface similarly colored or paler, often with orange tints and bruising blackish, smooth or showing shallow, decurrent veinlike ridges. The stalk is a tubular extension of the cap, hollow almost to the base, dark brown to blackish. Flesh thin, fibrous or brittle, colored like the cap. Odor fragrant or not distinctive. Taste not distinctive.
Spore Print: Pale pinkish-orange.
Occurrence: Scattered, in groups or clusters, often in moss banks under hardwoods or mixed woods. Late spring–fall.
Edibility: Choice.
Microscopic Features: Spores 11–14 × 7–9 µm, broadly elliptic, smooth. Hyaline.
Comments: Look-alikes with prominent veinlike ridges include the sickly sweet *Craterellus foetidus* (search online) and *Craterellus cinereus* (see photo on p. 20), which is odorless and densely clumped.

Craterellus ignicolor (R. H. Petersen) Dahlman, Danell & Spatafora
FLAME-COLORED CHANTERELLE
Description: Cap 1–8 cm wide, convex with a central depression that usually perforates into the hollow stalk. Margin incurved, sometimes wavy or lobed. Upper surface with tiny, erect, fibrous scales especially at the margin (use a hand lens), yellow-orange to brownish-orange. Lower surface pale yellow to orange-yellow at first, usually pinkish to lavender in age, with slightly decurrent gill-like ridges that are forked or cross-veined. Stalk 2–6 cm long, 3–12 mm thick, nearly equal, hollow, yellow-orange or yellow. Flesh thin, orange to yellow-orange. Odor and taste not distinctive.
Spore Print: Pale pinkish-yellow.
Occurrence: Scattered, in groups or clusters, often among damp woodland mosses. Summer–fall.
Edibility: Edible.
Microscopic Features: Spores 7.5–12 × 4.5–6.5 µm, elliptic, smooth. Hyaline.
Comments: The cap of *Cantharellus minor* (search online) measures 0.5–3 cm wide and doesn't usually perforate. It has a long solid stalk and is uniformly orange to yellow-orange.

and "pale rose bolete" (the photo shows mushrooms with a dark red cap) are hard to appreciate, and ones like blackening russula, white coral, showy bolete, lilac bolete, and red and yellow bolete, could apply to too many different species to be of much use. The names are followed by a concise macroscopic *Description*, the *Spore Print* color, *Occurrence*, *Edibility*, *Microscopic Features*, and *Comments*. The regions and habitats described in the *Introduction* are not utilized in the *Occurrence* section and the distribution of the species outside the Carolinas is not mentioned. Both would have been helpful. The *Microscopic Features* are those of the spores only, nothing is presented about cystidia, cap cuticle structure, etc., even when such features are essential for identification, as in *Inocybe* and *Tricholomopsis*. The brief *Comments* typically consist of single-feature comparisons, or a non-specific "compare," with one or two possible look-alike species and occasional bits of miscellany such as the meaning of the scientific name. Rather annoyingly, nearly every time a species that is not covered in the book is mentioned, we are advised to "search online." Such advice hardly seems necessary but, if it is, it could have been given once in the *How to Use this Book* section. Some of the alleged look-alikes are puzzling, such as *Mycena leaiana* being listed as similar to *Bolbitius titubans* despite them being very different in shape, color, habit, habitat, and substrate.

The book claims that "more than 50 [species are] appearing in a field guide for the first time." However, the actual number is fewer than 30 and even that total includes a sooty mold, a rust, and several leaf-deforming fungi that don't produce mushrooms. With a few exceptions, the names are up-to-date, appearing to follow those in *Species Fungorum*.

The principal hallmark of most previous Bessette books has been very good quality photographs. However, many of the ones in this book don't measure up to their past standards — some are excellent but all are hampered by their small size (about 2.5 inches wide) and almost square dimensions, so that a lot of unfortunate cropping was done to fit the format. The ones that show a small number of fruitbodies close-up are the most effective. Unfortunately, even many of these suffer from having been cropped directly through a fruitbody. Quite a few are underexposed and muddy or have off-color casts. Many others look as though the mushrooms had been dumped haphazardly onto the ground and then photographed from a distance while standing directly above them. Besides being unattractive, they lack sufficient detail to be effective for identification. A few of the photos, such as those presented for *Cortinarius cinnamomeus* and *Porodaedalea pini*, appear to have been misidentified and, in a few cases, the text description and photo do not agree. For instance, *Inonotus hispidus* is described as occurring on living hardwood trees but the photo shows it on a rotting log.

So, back to the original question — do we need another southeastern mushroom book? Overall, this one has little to make it stand out from the competition, other than containing a large number of species selected from a restricted area. But the high species count comes with trade-offs to save pages — small photos and very little helpful commentary. Carolina residents will benefit from the geographic focus and experienced southeastern mushroomers with established libraries will find it useful as an adjunct reference. However, a beginner or someone just starting to assemble their mushroom book collection would probably be better off with one of the other recent guides — *Southeastern Mushrooms* or *Mushrooms of the Northeastern United States and Eastern Canada* (despite its title, this book has quite a large number of species that occur in the Carolinas), or even my still-favorite for the area, *Mushrooms of West Virginia and the Central Appalachians*.

Steve Trudell

Mycotots

Mycotots is a Facebook page described as "a place to share your fungal enthusiasm with your children and others . . . This is a group to teach your little ones about our wonderful mycelial world". It is filled with photos of sweet kids and their fungal finds. I am sharing a few shots of some of the kids and their mushrooms, hopefully an inspiration to the possible Mycotots in your lives. Consider how good kids are at hunting fungi: they are lower to the ground, have better eyes, and are endlessly enthusiastic!

Archer, Pennsylvania

Cassidy, Indiana

Asa, Pennsylvania

Justyn, Oregon

Eliana, Wisconsin

Gillian, Connecticut

Kendyll, Tennessee

Sylas, Oregon

I suppose the first time we photographed our toddler with a mushroom, it was to show how big the mushroom was in relation to a little kid. As our daughter grew older, she became an active participant in our mushroom hunting activities each weekend with our local club, gaining praise from both her parents and other club members. Now a teenager, our daughter is an experienced hunter, a decent identifier, and mycophagy-lover. It is certainly a pleasure to pass on this skill to a new generation.

From Mushroom Observer to New Species

By Cecily Franklin

Garrett Taylor took these photos of Amanita cattaraugana

From the September/October issue WPMC Newsletter

Wild mushrooms present us with a never-ending treasure hunt. Sure, we tend to find the same species over and over. But every once in a while, we discover one that's somehow more interesting than anything we've found before. It's especially rewarding when one of the nationally recognized mushroom experts asks us to send in our specimen for further analysis. That's exactly what happened to WPMC Mycologist **Garrett Taylor**.

Back in July of 2015, Garrett was hunting for mushrooms near his home in Cattaraugus County. Located in Western New York, with one side bordering Pennsylvania, Cattaraugus County is home to the Allegany Indian Reservation of the Seneca Nation of New York, as well as Allegany State Park. The northern border of the county is formed by Cattaraugus Creek, and the Allegheny River (as we spell it here in Pennsylvania) flows through the county.

Garrett found an Amanita buried deep in the soil, where the egg grows under the humus layer. It could be mistaken for a truffle until it begins to expand or is unearthed. On July 12, he posted photos on the Mushroom Observer website. The very next day, Amanita expert Dr. Rod Tulloss expressed an interest in seeing Garrett's collection.

Within a week, Rod's team posted that "this material has been received and accessioned to Rod's herbarium" and "we have scheduled your material to be sampled for DNA sequencing."

The next posts occurred in November, after sequencing results were received. Rod was wondering if he might be dealing with multiple species, so he decided to ask for portions of all the mushrooms in the collection "to see if we get two different sequences". By the following January, Rod had determined that all pieces of this collection yielded a single "proposed fungal barcode" which also closely matched the barcode of a collection made by Dr. Linas Kudzma from New Jersey. "We will be submitting the sequences to GenBank shortly".

Rod had previously called this "Amanita species N64" but was ready to give it a new name. Rod and Linas decided on the provisional name of *Amanita cattaraugana*, "in honor of Cattaraugus Creek, Cattaraugus Reservation, and Cattaraugus County, New York". The common name is Cattaraugus Ringless Amanita.

Congratulations, Garrett!

Book Reviews for *The Mycophile*

One of NAMA's committees that remains little known to probably the bulk of the membership is the Editorial and Literature Committee, the literature function of which is coordinated by Steve Trudell. The committee has several charges in the NAMA Policy Manual but an important one is to provide reviews of books, DVD's, apps, software programs, and the like for publication in *The Mycophile*. If you learn of a new book (or DVD or whatever) that you feel would be of interest to other NAMA members, or if you would like to write a review, please contact Steve (mycecol@uw.edu) so that he can coordinate acquisition of the items and submission of reviews to the newsletter.

Maven of Mushrooms passes away in Mountlake Terrace, WA

Hanna Lore Tschekunow passed away at age 82 on September 11, 2019. She was a long-time mushroom enthusiast and was well-known in mycological circles. After growing up in Berlin, Germany, and living through difficult pre- and post-war years there (in fact the beginnings of her love for mushroom hunting came from searching for edible mushrooms in nearby woods while food was scarce), Hanna emigrated to the U.S. in 1962, along with her oldest brother. She met and married her husband, Alex Tschekunow, while they both worked at Monmouth General Hospital in New Jersey and they enjoyed many happy years in Branchville. Hanna moved into the poison control field of nursing, working for a number of years at the New Jersey Poison Information and Education System, where she used and grew her extensive knowledge of poisonous mushrooms. After Alex passed away, Hanna moved to Florida and continued her work in poison control in Miami. Throughout her entire professional life, Hanna took an active role in mycological clubs wherever she lived; she was among the founding members of the New Jersey Mycological Association, serving terms as both President and Secretary, and she was active with the North American Mycological Association as well, serving as Treasurer. In Washington state, she joined the Snohomish County Mycological Society and became known as one of its true expert identifiers, going on mushroom forays well into her 70's. She participated in many NAMA trips over the years, had several of her collected specimens written up, and gave talks on mushroom poisonings on a number of occasions. She was a good friend to mushroom giant, Gary Lincoff, participating in several of his trips, including one to South America. She loved the camaraderie of mushroom gatherings all over the world; she was a frequent visitor to Telluride and other sites, and always loved the fun. She cherished the friendships she made through mushrooms, staying close and writing letters to many of you over the years.

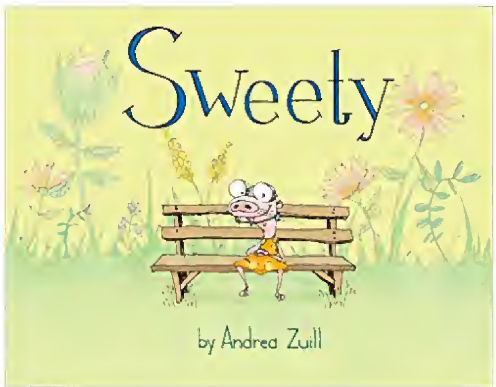
https://mushroomobserver.org/observer/show_observation/239332 Hanna's collected specimen on NAMA foray
https://mushroomobserver.org/observer/show_observation/239341 Hanna's collected specimen on NAMA foray
https://www.njmyco.org/newsletter/NJMA_News_46-1.pdf This NAMA newsletter has a memorial written by Greta Turchick, which includes a photo of her with Hanna.

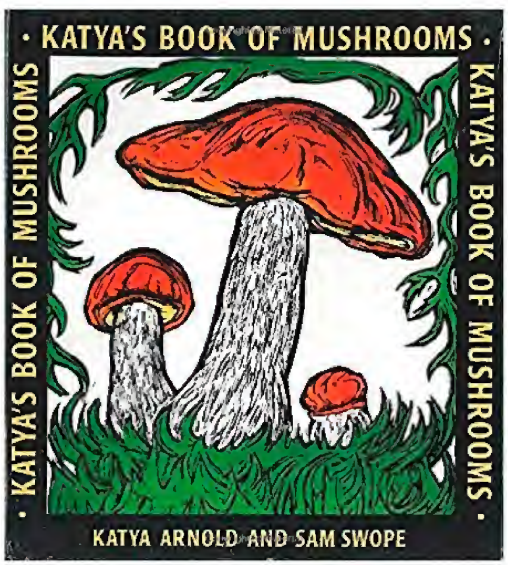
Book Suggestions for Mycotots

Just in time for the holiday gift-giving season, we present some classic and some newly-released fungi-themed book for kids. These books are a great way for parents or grandparents to share their love of fungi with the next generation.

Sweety
by Andrea Zuill

Sweety is awkward, even for a naked mole rat. She has protruding front teeth, thick glasses, and some very unusual hobbies, including fungus identification. She's intense and passionate — and her peers don't always get her. Surely there are other mushroom lovers out there. But how will she find them? Ages: 3 - 7 years. Hardcover: 32 pages. Publisher: Schwartz & Wade, March 2019



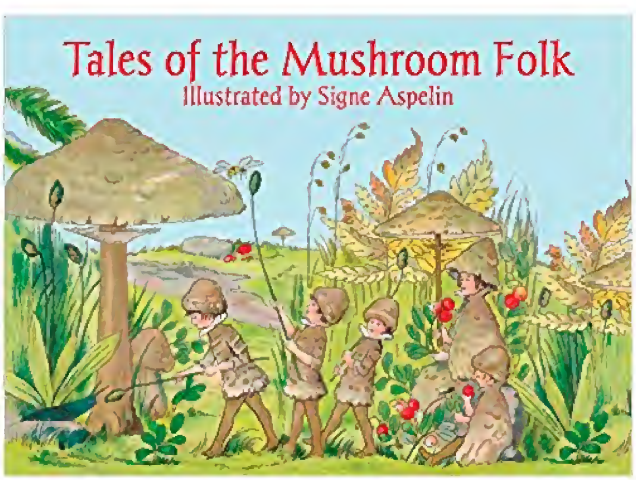


Katya's Book of Mushrooms
by Katya Arnold

From common Domestic Caps to the deadly Destroying Angel, from Octopus Stinkhorns to Scaly Hedgehogs – Arnold (Baba Yaga), a lifelong mycophile, here shares her passion for wild mushrooms. She serves up a glorious, earthy stew of fact, humor, folklore and personal stories likely to intrigue readers of all ages. Arnold weaves the serious study of mushrooms into the fabric of a gamesome, enterprising hobby, incorporating the charm of folk names alongside scientific terms and pairing activities with straightforward text. The illustrations are just as eclectic and exuberant: Arnold combines small paintings and cartoons against bright backgrounds; rustic artwork resembling woodcuts; and prints of mushroom caps. Ages 10-14 years. Hardcover, 48 pages. Publisher: Henry Holt and Co., March 1997

Tales of the Mushroom Folk
by Signe Aspelin

The mushroom folk are waking up from their winter sleep and emerging into the sunshine. Each family has its own characteristics and we get to know them well in these charming little tales. Meet the golden Coral Mushrooms, the bumpy Brain Mushrooms, the pale Parasol Mushrooms, the fat Puffballs, the stinky Stinkhorns and the regal Button Mushrooms. Illustrated in a classic style, this is a lovely picture book filled with natural detail of the woods and meadows where the mushroom folk live. Ages 4-7 years. Hardcover, 32 pages. Publisher: Floris Books, September 2016



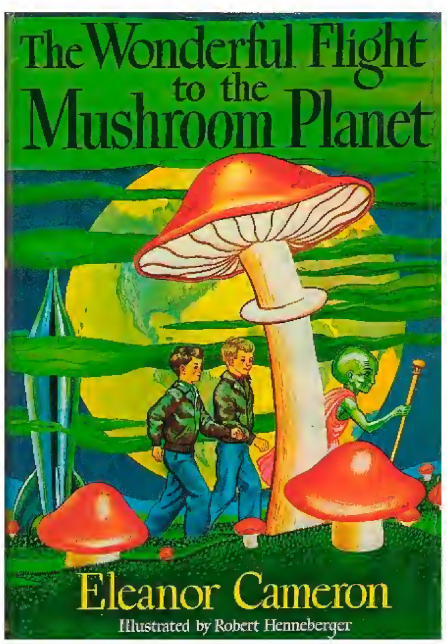
The Mushroom Fan Club
by Elise Gravel

Elise Gravel is back with a whimsical look at one of her family's most beloved pastimes: mushroom hunting! Combining her love of exploring nature with her talent for anthropomorphizing everything, she takes us on a magical tour of the forest floor and examines a handful of her favorite alien specimens up close. While the beautiful coral mushroom looks like it belongs under the sea, the peculiar *Lactarius indigo* may be better suited for outer space. From the fun-to-stomp puffballs to the prince of the stinkers – the stinkhorn mushroom – and the musically inclined chanterelles, Gravel shares her knowledge of this fascinating kingdom by bringing each species to life in full felt-tip-marker glory. Age range: 6 and up. Hardcover, 56 pages. Publisher: Enfant, May 2018

We are Fungi
by Christine Nishiyama

This genre-bending picture book tells dual stories side-by-side. A factually accurate story is told through words, while a more mysterious story is told through pictures, following the journey of a curious young girl as she ventures into the woods to hunt for mushrooms. As dusk falls, weird things begin to happen and as she travels deeper and deeper into the woods, she ends deeper and deeper in the world of fungi. Ages 4-10. Paperback, 42 pages. Publisher: Might Could Studios, September 2017

The Wonderful Flight to the Mushroom Planet
by Eleanor Cameron



In print since the 1950s, don't miss the adventures of Chuck and David, two boys who travel to the alien planet Basidium in their homemade spaceship. This timeless series is a classic that is sure to be read over and over again. Also look for additional books in the series, *Stowaway to the Mushroom Planet*, *Mr. Bass's Planetoid*, *A Mystery for Mr. Bass*, and *Time and Mr. Bass: A Mushroom Planet Book*. Ages 8-11 years. Paperback, 226 pages. Publisher (reprint edition) Little Brown Books for Readers, October 1988

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Fungi of the Issue: Allegheny Woodrat Midden

Allegheny Woodrat midden filled with mushrooms. Woodrats collect mushrooms and plants in the fall and dry them like Pikas, then transfer the goodies deep within their cliff homes for winter food. We think this one looks like it could be a centerpiece on a table. They have quite the artistic ability! They also like to decorate their nests with trinkets. Ohio, September 2019. Photo by Laura Hughes

Edited by: Karen Monger and Barbara Ching • Printed by Old Town Printing, Inc.